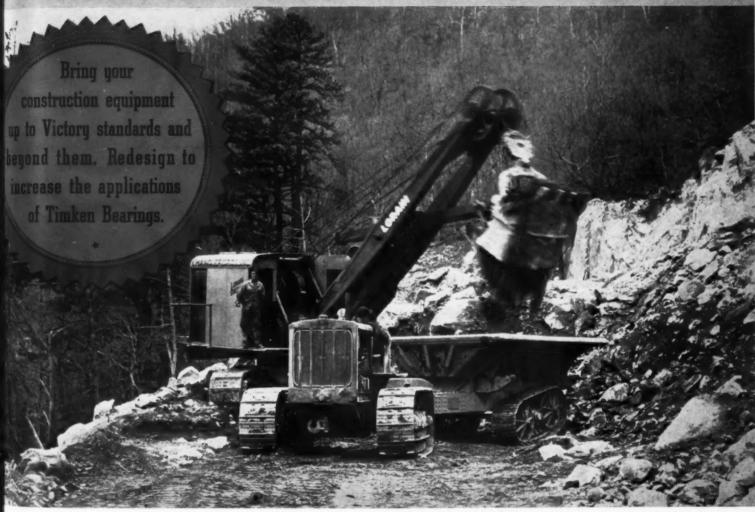
ROADS AND 1942 STREETS

OCTOBER 1942



13/4 yard Diesel Lorain 80 Shovel working on a Virginia section of the Skyline Drive. Photograph courtesy Thew Shovel Company, Lorain, Ohio.

he more Timken Tapered Roller Bearings here are in machines of any kind, the closer

N ASSURE VICTORY

DYUNITED STATES WAR MINISS BONDS & STAMPS they will come to meeting the requirements of war and peace.

A few Timken Bearings are better than none in any machine, but if you want all the advantages these bearings can give, you must have them at every bearing position. Then the threats of friction; wear; radial, thrust and combined loads; and misalignment of moving parts will be turned back for good.

This is a valuable point for every machine designer, manufacturer and user to remember.

TIMKEN
TADEMARK REG. U. B. PAT. OPF.
TAPERED ROLLER BEARINGS

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; and Timken Rock Bits.

HE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO





At air training fields throughout the nation thousands of eager young Americans tackle the

world's toughest training course in an effort to earn their "Wings" and a chance at combat duty. In the building of these training fields Adams equipment plays an important part. . . . Hauling scrapers and elevating graders move vast quantities of earth to change hills and valleys into smooth, level landing fields. Motor graders level and grade the runways, aprons and taxi-ways, mix and lay stabilized surfacing materials. On every job the dependability and versatility of Adams machines help constructors keep pace with the ever-expanding air training program. . . . When Victory is won, machines exceeding even wartime performance standards will be ready for you. They'll be worth waiting for!

J. D. ADAMS COMPANY . INDIANAPOLIS, INDIANA

Adams motor graders, leaning wheel graders, elevating graders, hauling scrapers, tamping rollers, buildozers and road maintainers are used by allied forces throughout the world,



This Adams heavy-duty motor grader is one of eight operated by the U. S. Army in constructing the runways of a new air training field in the south. . . . The two Adams hauling scrapers shown below are used by the Army on the same job.



TO KEEP YOUR EQUIPMENT ROLLING . . .

service and overhaut it regularly. See your nearest Adams dealer for new machines available under priority rating and for repairs and service on your present equipment . . . Wherever you are or wherever you go Adams co-operative service is near at hand.

ADAMS

ROAD-BUILDING AND EARTH-MOVING EQUIPMENT

How to choose and use WIRE ROPE SHEAVES

Practically every piece of wire rope on a "running" job operates over sheaves. By choosing sheaves which are exactly suited to the job, and then keeping those sheaves in good repair, the service life of the wire rope can be greatly lengthened. Here are some simple tips that have been tried and proved in service:

1. Check groove diameter—Make sure that the sheave groove is large enough so that it doesn't pinch the rope. The rope must seat freely down into the bottom of the groove. If it rides the sides of the groove, pinching and abrasion will result. Unequal strains will be set up. Much of the service life built into the rope will be lost.

For best results, observe the tolerances listed in the following table:

Nominal wire rope diameter	Minimum groove tolerance	Maximum groove tolerance
0 to 3/4"	+ 1/32"	+ 1/16"
13/16 to 11/8"	+ 3/64"	+ 3/2"
13/16 to 11/2"	+ 1/16"	+ 1/8"
1% to 21/4"	+ 3/2"	+ 3/6"
25/16" and larger	+ 1/8"	+ 1/4"

2. Check sheave diameter—The larger the sheave, the longer your wire rope will last. When a rope pulls sharply around a small-diameter sheave, it is subjected to severe bending and crushing. This tends to make the rope "go out of round," causes wear on outside wires, and stresses the various parts of the rope unequally.

It should be remembered that certain machines and equipment must of necessity be designed with

smaller sheaves than indicated by best sheave practice. This does not indicate poor design, but means simply that, all factors considered, the disadvantages of smaller sheaves are outweighed by advantages in other features of the design.

But whenever there is a choice between a small sheave and larger one—the larger diameter sheave should be used.

3. Keep grooves and flanges smooth—After a sheave has been handling heavy loads for some time, the imprint of the rope lay is apt to be worn into the groove of the sheave. A wire rope, working over this sharp-edged imprint, is subject to abrasion and loss of operating efficiency.

If a new rope is put in service over such a sheave, its lay will not fit into the imprints and the "chewing" or "filing" action will be greatly increased. Even if a new rope is not installed, the old rope will be badly abraded as its lay lengthens and enlarges the depth and length of the imprint.

The best way to prevent sheave grooves from wearing prematurely is to select a sheave made of the proper material. Manganese steel sheaves (which are now difficult or impossible to get) are the best all-around sheaves available. Other alloy steels have also been used with success.

However, if you cannot get special sheave steel, the next best thing is to take care of the sheaves you do have. Inspect the sheave grooves frequently. If evidence of wear develops, smooth up the grooves immediately in accordance with groove tolerances which appear in the foregoing table. You will be more than repaid for the effort in longer sheave and rope service and in more efficient operation.

BETHLEHEM STEEL COMPANY



ROADS AND STREETS

Vol. 85, No. 10

October, 1942



A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations; and to the construction and maintenance of airports.

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD

CONTENTS

Double Tracking on U. S. Route 12 to Serve War Industry	35
Fire Control and Fire Control Roads in Nicolet National Forest—Part II	41
By LOUIS TAUSCH, JR. Forest Ranger, Argonne National Forest, Wisconsin	
Five Mile Road Required 700,000 Cu. Yd. Excavation	44
Six New Roads for War Purposes By H. P. GILLETTE Editor ROADS AND STREETS	47
Seventy Years of Wooden Sidewalks	48
Borrow Pit	50
Used Construction Equipment Order As Amended September 28	53
Bituminous Runway Construction By J. C. BLACK Field Editor ROADS AND STREETS	54
Care, Repair and Maintenance of Equipment (For Detailed Index See Page 69)	67
Editorial	66
About Contractors and Their Jobs	88
Personal Items About Engineers	90
New Trade Literature	91
New Equipment and Materials	92
With the Manufacturare	03

Published by Gillette Publishing Ce. Acceptance under the Act of June 5, 1934, authorized January 25, 1938, at Chicago, Illinois. Subscription price \$3.00 per year in the United States, \$3.60 per year in Canada, \$4.00 per year for foreign mailing.

STAFF

HALBERT P. GILLETTE, Editor-in-Chief

EDWARD S. GILLETTE, Editor and Publisher

CHARLES T. MURRAY Managing Editor

JOHN C. BLACK, Field Editor

HAROLD J. McKEEVER Associate Editor

MAJOR V. J. BROWN
Publishing Director
(Absent on Military Duty)

H. J. CONWAY Advertising Editor

GILLETTE PUBLISHING COMPANY

330 S. Wells St., Chicago, III. ESTABLISHED 1906

PUBLISHERS OF

ROADS AND STREETS
POWERS' ROAD AND
STREET CATALOG
WATER WORKS AND
SEWERAGE
CAMINOS Y CALLES
TECHNICAL BOOKS

BUSINESS REPRESENTATIVES

Chicago Office

E. C. KELLY
E. H. HICKEY
L. H. LINGNOR
330 S. Wells St., Chicago, III.
Telephone: Harrison 1843

New York Office

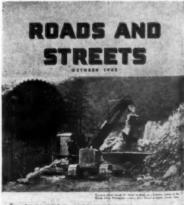
J. M. ANGELL, JR.
A. E. FOUNTAIN

155 East 44th St., New York, N. Y.
Telephone: MUrrayhill 2-6023

Cleveland Office

8. C. BRUMM 2025 Lakeland Ave., Lakewood, Ohio Telephone: Lakewood 4466

Los Angeles Office
DON HARWAY & CO.
816 West Fifth St., Los Angeles, Calif.
Telephone: Mutual 8512



Process and the Advances of the forces of the control of the contr

TIMKE





YOU can't fight a fire with a frozen bucket of water. Nor can you fight icy highways with a frozen stockpile of abrasives.

Extensive preparations for the winter season just ahead are effectively nullified unless the abrasives you stockpile now are protected *now* by freezeproof calcium chloride treatment.

The few dollars you invest for stockpile treatment will actually save hundreds when your ice control operations get underway. Less men and equipment will be needed for loading of trucks. Valuable time will be saved. And the treated grits will go farther, do a much more effective skidproofing job.

Calcium chloride treatment gives maximum protection under any conditions for, as the Committee on Safe Highways of the American Road Builders' Association has reported, "the value of the chemical treatment lies in the anti-freeze properties of its solutions. Calcium chloride may provide protection against freezing at any temperature down to minus 58 degrees F."

Write today for complete data on stockpile or storage bin preparation. Save money while doing a better ice control job this winter.

CALCIUM CHLORIDE ASSOCIATION
4145 Penobscot Bldg. Detroit, Mich.



1:

2:

3:

4:

BIRMING MOBILE MONTGO

PHOENI

LITTLE

LOS ANO

DENVER

EAST HA

JACKSON MIAMI, TAMPA,

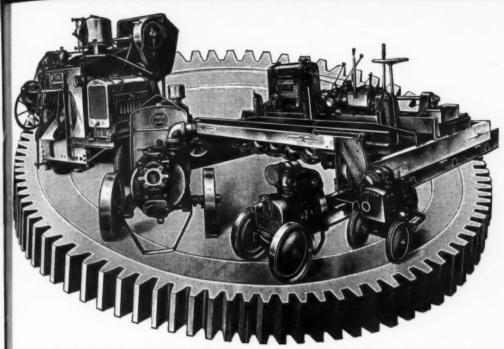
ATLANTA

CHICAGO

CALCIUM CHLORIDE

FAST . POSITIVE . ECONOMICAL

Mr. Contractor, WE'VE GOT WHAT YOU NEED



- 1: YOUR GOVERNMENT HAS URGENT USE FOR ALL IDLE CONSTRUCTION EQUIPMENT. WE WILL BUY, RE-SELL OR REBUILD YOUR WORTHWHILE IDLE MACHINES.
- TRAINED EQUIPMENT MECHANICS, with factory shop facilities, and a full stock of repair parts.
- NEW JAEGER MIXERS, PUMPS, HOISTS, ROAD MACHINERY for any important job, as long as our stocks hold out.
- EQUIPMENT FOR RENT to contractors to meet many needs and priority problems.

As Near to You as Your Telephone

BIRMINGHAM,
MOBILE,
Turner Supply Company
MONTGOMERY,
Ray-Brooks Machinery Co.

ARIZONA

PHOENIX, Smith-Booth-Usher Company

ARKANSAS

LITTLE ROCK, Choctaw Culvert & Mach. Co.

CALIFORNIA

LOS ANGELES, Smith-Booth-Usher Company SAN FRANCISCO, Bacon Company, Edward R.

COLORADO DENVER, Moore Equipment Company, H. W.

CONNECTICUT

EAST HARTFORD, Hedge & Mattheis Company WEST HAVEN, Hedge & Mattheis Company

FLORIDA

JACKSONVILLE, Moody, M. D.
MIAMI,
TAMPA, Llewellyn Machinery Corp.
Cameron & Barkley Co.

ATLANTA, Armstrong & Bro. Company, R. S.

ILLINOIS

CHICAGO, Arrow Contractors Equipment Co.

INDIANA

FORT WAYNE, INDIANAPOLIS, BOUTH BEND,

Pioneer Coal Company Standard Equip. & Supply Corp. Deaney, A. F. General Equipment Company

IOWA

DAVENPORT, Arrow Equipment Company WATERLOO, Waterloo Construction Company

LOUISVILLE, Whayne Supply Company, Roy C.

Fletcher Equipment & Supplies Southern States Equipment Co.

MAINE

BANGOR, Hedge & Mattheis Company PORTLAND, Hedge & Mattheis Company

MARYLAND

BALTIMORE, John C. Louis Co., Inc. BETHESDA, John C. Louis Co., Inc.

MASSACHUSETTS

BOSTON,
WEST SPRINGFIELD,
WORCESTER,
Hedge & Mattheis Co.
Hedge & Mattheis Co.

DETROIT, Burke, Cyril J.
DETROIT, Schuster Equipment Co.
GRAND RAPIDS, Keller Tractor & Equip. Co.

MINNESOTA

DULUTH, Standard Salt & Cement Co. MINNEAPOLIS, Minneapolis Equipment Co.

MISSISSIPPI

JACKSON, Choctaw Culvert & Mach. Co.

MISSOURI

KANSAS CITY, Bublitz Machinery Company ST. LOUIS, Allied Construction Equip. Co.

MONTANA

HELENA, Montana Powder & Equipment Co.

NEBRASKA

OMAHA, American Machinery & Supply Co.

NEW HAMPSHIRE

CONCORD, Hedge & Mattheis Company

NEW IERSEY

NEWARK. The Jaeger-Lembo Machine Corp. RED BANK, Prather, Grafflin S.

NEW MEXICO

ALBUQUERQUE, Harrison Co., R. L.

NEW YORK

ALBANY (MENANDS),
BUFFALO,
CORONA, L. I.,
PLATTSBURG,
ROCKVILLE CENTRE, L. I.,
ROCHESTER,
SYRACUSE,

Kelley Co., Inc. E. B.
Rupp Equip. Co.
Jager-Lembo
Machine Corp.
Jerry, Vincent S.
Jager-Lembo
Machine Corp.
Syracuse Supply Co.
Syracuse Supply Co.

NORTH CAROLINA

RALEIGH, North Carolina Equipment Co. STATESVILLE, North Carolina Equipment Co.

OHIO

AKRON.
CANTON.
CINCINNATI,
CLEVELAND,
DAYTON,
GALLIPOLIS,
HAMILTON,
TOLEDO,
YOUNGSTOWN,
Stambaugh-Thompson Co.

OKI.AHOMA

OKLAHOMA CITY, Wylie-Stewart Mach. Co.

OREGON

PORTLAND, Nelson Equipment Company

PENNSYLVANIA

ERIE, John F. Steiner
HARRISBURG, Standard Equipment Company
PHILADELPHIA, Service Supply Corporation
PHITTSBURGH, Highway Equipment Co.
WILKES-BARRE, Standard Equipment Co.

RHODE ISLAND

PROVIDENCE, Hedge & Mattheis Company

SOUTH CAROLINA

COLUMBIA. Bell-Lott Road Machinery Co.

TENNESSEE

CHATTANOOGA, Osborne Equipment Company
KNOXVILLE, Osborne Equipment Company
MEMPHIS, Choctaw Culvert & Mach. Co.
NASHVILLE, McCarthy, Jones & Woodard Co., Inc.

DALLAS, Browning-Ferris Machinery Co. EL PASO, Tri-State Equipment Company HOUSTON, Browning-Ferris Machinery Co.

SALT LAKE CITY, Jones Equip. Co. The C. H.

BELLOWS FALLS, Hedge & Mattheis Company BURLINGTON, Strong Hardware Company

VIRGINIA

LYNCHBURG, Branch, Marion S.
NORFOLK, Hampton Roads Tractor & Equip. Co.
RICHMOND, Smith-Courtney Company

WASHINGTON

SEATTLE, A. H. Cox & Company SPOKANE, Nelson Equipment Company

WEST VIRGINIA

CHARLESTON, CLARKSBURG, HUNTINGTON, WHEELING, Capital City Supply Company General Equipment Co., Inc. Banks-Miller Supply Company Seabright Co., H. L.

MILWAUKEE, Boehck Equipment Company

WYOMING

CHEYENNE, Wilson Equipment & Supply Co.

JAEGER DISTRIBUTORS IN OVER 100 CITIES ARE "GEARED UP" FOR WAR SERVICE

Above: Snogo is fast, easy to handle and it packs a truck full in 10 to 20 seconds Right: Snogo can work at night and do a large part of the job before traffic becomes heavy.





winter war effort on every home front.

Snogo means safer, open winter roads. Snogo means better community health—open roads for the doctor, the fire department, the police department, the ambulance.

—And Snogo does it at low cost. When Snogo gets through the job is done until the next snowfall—no banks to drift, no expensive repeat plowing, no rehandling—and driveways, doorways and cross-roads are clear.

Don't let snow fight for the axis! Snogo is sure protection.

KLAUER MANUFACTURING CO.

Dubuque · lowa

THERE IS A SNOGO FOR EVERY BUDGET — FROM A 11/2 TON TO THE LARGEST FOUR WHEEL DRIVE TYPE OF TRUCK

Assure Delivery with Open Roads!



WAR IS HELL! Yet this war could be worse than hell. Crucial battles will be lost and needless thousands of lives sacrificed unless our fighting men get all the equipment they need.

LET'S LOOK AT THE FIGURES: Most of this equipment is largely made of steel. Our steel industry made sixty-seven million tons in 1940. It produced eighty-three million tons in 1941. *Tet we need still more*. This year the steel industry can produce ninety million tons if you and other Americans will gather up and turn in six million additional tons of scrap.

WHY SCRAP IS NEEDED: New steel is made from scrap iron and pig iron—about half and half. Because the scrap has already been refined it cuts down priceless production time. WHAT CAN *TOU* DO? Plenty! Gather up all worn-out or obsolete tools, equipment and other useless materials. Urge your associates to do the same. Then call the scrap dealer. He'll hurry it off to the steel mills. All scrap will be purchased by the steel industry at government-controlled prices.

BACK UP OUR FIGHTING MEN: The least you can do for our fighting men, perhaps one close to you, is give them the equipment they must have. Every minute is precious. Get in the scrap—fast. Armco Drainage Products Assn., Middletown, Ohio,



This advertisement is in support of the Salvage Program of the Conservation Division of the War Production Board.

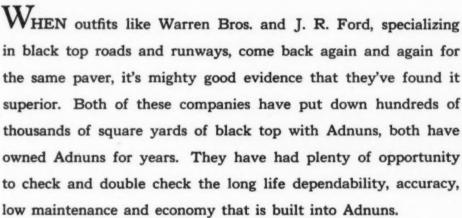
BLACK
TOP
Paving
Specialists
Choose
ADNUN
again
and
again!

Another Admin this year for WARREN BROS. ROADS CO. WARREN BROS. ROADS CO. Mass.

makes their GRAND TOTAL 32

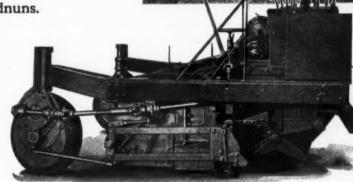
3 more Admins this year for J. R. FORD CO. Richmond, Va.

makes their GRAND TOTAL 14



There is no better guide to your purchase of black top machine than the testimonial of 32 orders from one contractor!

Watch Adnuns work today and you will know they are the machines you want and need—now and tomorrow.



THE FOOTE COMPANY, INC., Nunda, New York

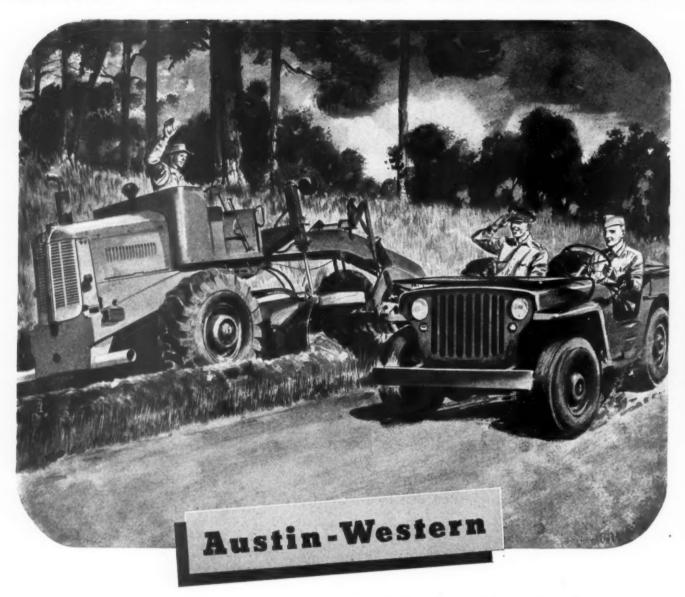
"World's Largest Exclusive Manufacturer of Concrete and Black Top Pavers"

ADAWA BLACK TOP PAVERS

PAVERS MULTIFOOTE

CONCRETE

EVERY ROAD LEADS TO VICTORY



There are no unimportant roads in America today! Unless food products move over 'secondary' farm-to-market roads with dispatch and unfailing regularity... unless raw materials and finished parts get to far-flung processing, fabricating and assembling plants on schedule... the vital high-speed timetables of our armed forces and armament builders can't be maintained.

Since war needs make it impossible for you men who must build and maintain America's roads to get much new equipment, it's mighty important to keep available machines in the pink of condition.

This calls for instructions to operators on avoidance of abuse, overloading and excessive speeds.

Even ruggedly built A-W machines have endurance limits. And regular inspection and maintenance by men who know exactly what to do, means extra years of effective performance... will help you keep irreplaceable equipment operating for the duration.

Your nearby Austin-Western dealer has this experience. He is trained and equipped to do a thorough job with a minimum of lay-up time for the machines. Use his expert service for all major maintenance and repair jobs. He will gladly help you work out a practical system of operator instruction, of inspection, lubrication and adjustment that will prevent many breakdowns . . . help you make good on your vital assignment of keeping em rolling on the home front.

THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Illinois

MOTOR GRADERS - BLADE GRADERS - ELEVATING GRADERS - SCRAPERS - CRUSHING AND SCREENING PLANTS - ROLLERS ROLL-A-PLANES - MOTOR SWEEPERS - SHOVELS AND CRANES - SCARIFIERS - DUMP CARS - TRAIL CARS



• The most important consideration in any war program is the spirit and unity of the folks who must be counted upon to carry it through. And along those lines we like what James A. Garfield said in 1864, and we quote:

"A Nation is not worthy to be saved if, in the hour of its fate, it will not gather up all its jewels of manhood and life, and go down into the conflict, however bloody and doubtful, resolved on measureless ruin or complete success."

If your life was at stake, you would do something about it. What of the Nation . . . made of lives like yours . . . and ours?

THE GALION IRON WORKS & MFG. CO.

Main Office and Works:

• GALION, OHIO





THETHER you call them, in your part of the VV country, "snake holes", or "toe holes", or simply "flat holes" - it's all the same to a Cleveland DR30 wagon drill. These low, slightly angling holes are just one kind that the Cleveland handles extremely well. It drills in any position, at any angle - straight down, flat, breast high, or higher than your head, or within four inches of the ground level - even straight up, when such a hole is needed. You will like the way it cleans the hole, and the drill runner will be enthusiastic with its ease of moving from one position to another. The DR30 has a feed capacity of more than eight feet. It handles depths to twenty-five feet, and more. You will want to see the recoil device, the handy centralizer, the double-screw, geared-together mechanism for raising the U-bar. Demonstration will be arranged to suit your convenience. May we send new Bulletin 132?

BRANCH OFFICES

Birmingham, Ala. Berkeley, Calif. Boston, Mass. Buffalo, N. Y. Butte, Mont. Chicago, Ill. Cincinnati. Ohio Dallas, Texas
Detroit, Mich.
El Pasc, Texas
Ironwood, Mich.
Los Angeles, Calif.
Milwaukee, Wis.

Philadelphia, Pa. Pittsburgh, Pa. Richmond, Va. Salt Lake City, Utah St. Louis, Mo. Victor, Colo. Wallace, Idaho

CANADIAN DISTRIBUTORS

Purves E. Ritchie & Son, Ltd., 658 Hornby St., Vancouver, B. C. Whitehall Machine & Tools, Ltd., Galt, Ontario

Due to the necessity for conserving rubber, we can supply pneumatic tires only on special order for Government projects. You will find the broad-rimmed steel wheels a satisfactory substitute. There is a suitable price adjustment on account of omitting the rubber tires.



THE CLEVELAND ROCK DRILL CO. CLEVELAND, OHIO





It's "OVER THE TOP" ...OR ELSE!

They don't waste time in the Army



UNCLE SAM can't fool around! There isn't time. Our armed forces have a job to do—the biggest job in bistory—and they're sailing into it with typical American speed and efficiency.

There are no weaklings in the striking power our nation is assembling. The men are tough—and so are the machines. The International TracTracTor shown here is one of thousands now slugging their way along the hard road to Victory. These big

day, but every last one of them is more than capable of going "over the top" whatever the task.

Expert service by skilled army men maintains the equipment of mechanized war. On the home front your International Industrial Power dealer is ready with the experience and facilities to give your TracTracTor the best possible service. It will pay you to keep in touch with him.

INTERNATIONAL HARVESTER COMPANY

180 NORTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

BUY WAR BONDS

SHARE YOUR CAR

SELL YOUR SCRAP

NTERNATIONAL Industrial Power

THIS IS NO TIME FOR TIME OUT

Sign the Pledge and qualify to display the Official Emblem of the U. S. Truck Conservation Cosps on every one of your trucks. Get your emblem—a decalcomania transfer — from your nearest FWD branch or dealer.



This idle old, to t

'em Beco

FWD de signed the partation to display

See y

ties,

FWD

TH







KEEP YOUR FWD's ROLLING AND WORKING . . . NO MATTER HOW OLD . . . WITH FWD SERVICE

This is no time to have any trucks standing idle . . . or to make only part-time use of old, worn trucks. Every truck is valuable to the war effort . . . use 'em or recondition 'em to keep 'em rolling!

Because extra ruggedness - extra depend-

ability — is built into FWD trucks in keeping with the traditionally sound FWD fourwheel-drive principle, you can gain many added miles of service and complete fulltime usefulness from FWD trucks that are veterans of heavy service of ten years or more.

SEE YOUR FWD BRANCH OR DEALER . .

OFFICIAL STATION
U.S.
TRUCK
CONSERVATION
CORPS

Address of the total to be forted to the control of the control

FWD dealers and branches have signed the Office of Defense Transpertation Piedge and are qualified to display this official poster. ... ask about FWD's progressive interchangeability of improvements and vital parts ... find out how worn parts and units, subject to heavy wear and tear, can be progressively replaced with modern equipment and your truck kept in action! Owners of FWD's know that their trucks never become "orphans"... that progressive interchangeability of improvements and vital parts keep FWD's in service far beyond normal expectancy of most trucks.

See your FWD branch or dealer . . . they're pledged with the Government's program . . . they are equipped with the facilities, skill, and experience to put new life into even the oldest FWD — no matter how "scarred" with long years of service.



THE FOUR WHEEL DRIVE AUTO COMPANY CLINTONVILLE, WISCONSIN . Canadian Factory, KITCHENER, ONTARIO

SPEED + ACCURACY IN FINISHING



High spots are removed and low spots filled by the Longitudinal Finisher without changing density of the surface concrete.



AT ANY PAVER SPEED

With a Koehring Longitudinal Finisher it's easy to meet the high speed production of your paver and still maintain surface accuracy in accordance with job specifications. Finishing speed does not affect this accuracy... the Finisher speed can be easily adjusted to keep pace with the paver. Koehring Finishers are designed to do accurate finishing at the proper time — immediately after the initial set. With a Koehring your concrete surface is consistently accurate — as accurate at the end of the day as after the first pour.

KOEHRING COMPANY

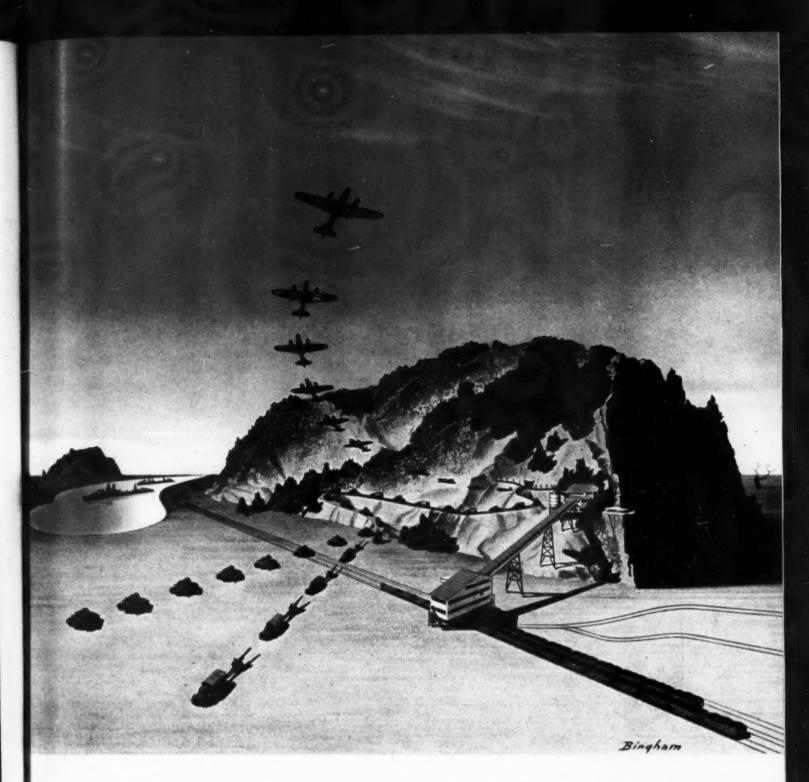
HEAVY-DUTY CONSTRUCTION EQUIPMENT

ROADS AND STREETS, October, 1942

This and to be of en

and is baline

comir



Ships, planes, guns, tanks start in a coal mine

This is a war of machines and armaments, and vast quantities of power are required to build them. Despite all the other forms of energy, 60% of all horse-power required by American industry comes from coal.

Our whole civilization is based on coal, and our whole defense of that civilization is based on it. Coal provides heat. Gasoline can be made from coal. Rubber is about to be made from it. Many vitamins are coming from coal's derivatives.

Coke made from coal is indispensable to steel. Railroads consume one out of every five tons mined. Dozens of vital industries look to it for one or more of the 150,000 chemical compounds already identified through coal carbonization.

Koppers builds most of the coke ovens which carbonize millions of tons of coal... is an important producer of chemicals for war... of anti-aircraft gun mounts, airplane catapults... airplane, submarine,

diesel and automobile piston rings . . . Fast's Couplings for power transmission . . . pressure-creosoted timber, ties and piling . . . and dozens of other products. Koppers Company, Pittsburgh, Pa.

Buy United States War Bonds and Stamps

THE INDUSTRY THAT SERVES ALL INDUSTRY



as close as your phone

You awake on the morning of December 7, 1941, to the dawn of the biggest revolution in the dirt-moving industry. Jobs so big have since been awarded it has



ROADS AND STREETS, October, 1942



The Tanks Are Coming!

Thanks to a continuous supply of vital raw materials and the tireless effort of the construction industry, tanks are rolling off the Nation's assembly lines in staggering numbers. Marion shovels, working without let-up, are doing a real job in keeping tank production ahead of schedule by digging the essential raw materials and clearing the way for new plants. Here is the supreme test of Marion's dependability.

THE MARION STEAM SHOVEL CO.

Marion Ohio, U.S.A. Offices in all principal cities

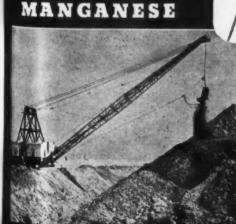
MARION

SHOVELS . DRAGLINES . CLAMSHELLS

Gasoline - Diesel - Electric - 34 cubic yard to 35 cubic yards



NICKEL



COAL



IRON



COPPER





While this company's facilities are being used entirely in the war effort, a limited number of bituminous plants for defense purposes are available.

WE INVITE YOUR INQUIRIES.





Soil Stabilization

By V. J. Brown Publishing Director ROADS AND STREETS

C. A. Hogentogler
Senier Highway
Engineer,
U. S. Public Roads
Administration

C. A. Hogentogler, Jr.
Research Engineer,
George Washington University
Frank H. Newman, Jr.
Binder Research Engineer,
Texas State Highway Department

Tesus State Highway Department
C. M. Lancaster
Soils Engineer,
Missouri State Highway Department

E. S. Barber
Junior Highmay Engineer,
U. S. Public Roads Administration



This book is reprinted from a series of articles published in ROADS AND STREETS. Demand for the series was world wide. The book treats of fundamentals of soils mechanics and soil stabilization such that the average engineer can get a complete understanding of this new branch of highway engineering.

Profuse illustrations tell more than words could.

141 pages-Hard binding

Price, \$2.00 Plus Postage

GILLETTE PUBLISHING CO ..

330 S. WELLS ST.

CHICAGO ILL.

MORE YEARS OF SERVICE IN BLACKHAWK POWER-PACKERS

You're all set to meet the extra demands of the times if your snow-plows and other road machines are equipped with Blackhawk Hydraulic Rams and Power-Packer Hydraulic Controls. They were built for years of dependable lifting power, speedy action, efficiency and accuracy. Give 'em proper care, service 'em right and they'll carry on "good as new" for years. Before winter sets in, be sure to refill all pump units with Blackhawk Winter Oil No. 71—(under no circumstances should brake fluid or other substitutes be used). Check over all units now—and if minor repairs are needed, write for name of nearest Blackhawk Authorized Service Station where you may secure necessary repair parts.

A Product of BLACKHAWK MFG. CO., Dept. RS, Milwaukee, Wis.



If Trenchers Wore Medals, Buckeye's Would Have a Chest Full!

ot all decorations in war denote courage. Some show participation in campaigns. Others are recognition for tough jobs capably performed. That's the Buckeye's class—for steady, consistent performance in any kind of going, they have helped to lay the groundwork for America's

offensive, in war project after war project.

Few realize the tremendous amount of trenching required for army camps, naval bases, air fields, ordnance depots and munitions plants. Before anything else, there must be trenches for drainage—for sewage—for water, gas, electricity—for foundation footings. Broad areas must be criss-crossed with these essential trenches before buildings can rise, troops commence training, assembly lines start functioning.

From Key West to Puget Sound and from Passamaquoddy to San Pedro, Buckeye Trenchers have taken hundreds of these RUSH JOBS in stride, conserving millions of hours of man-power for Uncle Sam and advancing the completion of war projects by weeks and months. No wonder then, that the men who plan and build for the government and war industries want to pin medals on Buckeye Trenchers "for gallant achievement in line of duty"!

For years, Buckeye Digging Wheel and Ladder Type Trenchers have been ably serving contractors and public works officials of the nation in countless trenching campaigns. For maximum speed and economy with minimum outlay for equipment and maintenance, they rate all the honors industry can bestow.

Today, every Buckeye Trencher is working for Victory and all our efforts and plant production are dedicated to the same purpose.

Buckeye Traction Ditcher Company Findlay, Ohio





Top: Buckeye "12" Wheel Type Trencher hustles in telephone cable, removing hazard at a pilot training center.

Bottom: A Model 410 Ladder Type Trencher performs "distinguished service" at a southeastern Army camp, working from sun-up to dusk, to speed trenching for drainage, sewerage, water pipe and foundation footings.

Built by Buckeye

Convertible Shovels



Trenchers



Tractor Equipment



R-B Finegraders



Road Widener



Spreaders



WHERE THERE IS STEEL THERE IS HAZARD LAY-SET Preformed HELPING STEEL MEN HELP AMERICA

★ Hazard LAY-SET PREFORMED lasts longer—that's why it can help you produce more. Operators everywhere know LAY-SET to be the flexible, willing wire rope. They know it is easier to handle; safer to handle. It reduces lost-time accidents; cuts down the frequency of machine shutdowns for rope replacements; steadies machine production. With Hazard LAY-SET PREFORMED WIRE ROPE you can save time, save men, save money. And anything that can do that is an essential to industry, a vital necessity to the Nation.

camp

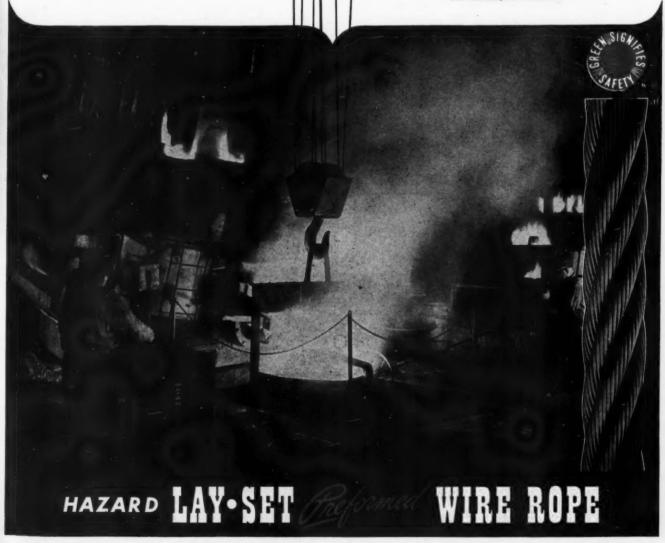
HAZARD LAY-SET Preformed LENDS A HAND

The job of LAY-SET PREFORMED WIRE ROPE in the steel industry is to lift, to haul and to hold. Huge shovels of raw ore, great ladles of molten metal, tremendous tonnage of finished steel ready to be fabricated, all depend on LAY-SET. You'll find it on power shovels, drag lines, scrapers, gantry cranes, ship hoists, car dumpers, overhead traveling cranes, electric hoists—doing more work at less cost with fewer accidents and delays.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa. - Atlanta - Chicago - Denver - Ft. Worth - Los Angeles New York - Philadelphia - Pittsburgh - San Francisco - Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT, CONNECTICUT





And it's tough on Diesel oil— But hark while we chant of a cold storage plant (Where you keep things, lest they spoil).

Back in April, 'Forty-yes, 1940-A big six-cylinder Dies' Went to work with a will, creating a chill-Its motto: "I aim to freeze."

Oh, the North Countree is a hard countree, And a year is twelve months long; Yet, it's perfectly true that in March, '42, This Diesel still ran like a song!

Oh, oil-buyers wary, oh oil-buyers chary, You can see that the moral is clear: Your Diesel runs swell-o on RPM DELO And does so for many a year!

EVER since the Marshfield Cold Storage Company of Marshfield, Wisconsin, installed its International UD-18 6-cylinder, 108-H.P. Diesel in April, 1940, the engine has been lubricated exclusively with RPM DELO. It has had 10,000 hours of continuous operation—and here are the results:

When the engine was thoroughly overhauled last March, cylinders showed less than .0035 inch maximum wear, pins were all tight and showed less than .002 inch wear, rod bearings were in "exceptionally fine condition." No wonder the company says, "we are indeed happy we selected RPM DELO as our lubricant and would not hesitate to highly recommend it."

STANDARD OIL COMPANY OF CALIFORNIA

RPM DELO is marketed under the following names:

RPM DELO . Caltex RPM DELO .

Signal RPM DELO . Imperial-RPM DELO Sohio RPM DELO

Ask your Diesel engine manufacturer or distributor for the RPM DELO supplier in your vicinity



THE A

Water

on bri

ment.

tegic

consti

pany.

their made

war e

traffic

rectly rail no It exe skill th

critica former



THE ACCELERATING TEMPO OF WAR TRAFFIC over America's highways, railroads and waterways has placed new importance on bridges as expediters of rapid movement. These two bridges typify the strategic roles now played by many spans constructed by American Bridge Company. Though completed recently, in their short terms of service they have made an inestimable contribution to the war effort by speeding and integrating traffic over key routes.

THE 322-FOOT BASCULE BRIDGE, shown directly above, is an important link in a rail network serving industrial Texas. It exemplifies the kind of engineering skill that must go into bridges in these critical days. The center pier of the former swing span split the Neches

River into two narrow channels. Increased river traffic brought an insistent demand for a single navigation channel at least 200 feet wide. The new bridge accomplished this successfully. It was erected and the old span dismantled without disrupting train movements, except for an 11-hour interval. Now, rail traffic moves faster because the bridge can be raised and lowered in a fraction of the time required to operate the old swing span. And river traffic conditions are greatly improved by the wider channel.

WAR TRANSPORT IS SPEEDIER to east coast shipping points because of the new 2004-foot Passaic River lift-span bridge, shown at the top. Delays to the movement of motor traffic on a N. J. highway

are greatly reduced. The high-level lift span, having a vertical clearance of 40 feet when closed, requires only a fifth as many openings as were formerly necessitated by the old low-level drawbridge, and openings require less time. This bridge was chosen by the American Institute of Steel Construction as the most outstanding in the movablebridge group opened to traffic in 1941.

IT MEANS MUCH TO US to know that hundreds of American Bridge-built spans throughout the country are helping to clear the way for faster war transportation. Today, and until Victory is won, our entire resources of equipment, engineering talent, and specialized "know how" are pledged to projects directly essential to the war.

AMERICAN COMPANY

General Offices, Frick Building, Pittsburgh, Pa.



· Chicago

Minneapolis · New York · Philadelphia

· Cincinnati · Cleveland · Denver · Detroit · Duluth

Columbia Steel Company, San Francisco, Pacific Coast Distributors

United States Steel Export Company, New York

TED STATES STEEL





Shipyards throughout the country employ MICHIGAN Mobile CRANES in huge yardexpansion and shipbuilding programs. MICHIGAN mobility, speed and endurance contribute to fast erection of war-plants,

power lines, pipe lines and countless other

vital facilities. These Air-Controlled MICHIGAN Mobile

important to the success of your future peace time program as well as to your present war-effort. Our engineering staff can offer valuable suggestions and cooperation in helping you solve your problems. Bulletin S-102 contains complete information. Write for CRANES (3 to 12 ton capacities) may be your copy today.

CON

BULK (

MICHIGAN POWER SHOVEL CO., Benton Harbor, Michigan, U. S. A.

SHOVELS - CRANES - CLAMS DRAGLINES - TRENCH HOES

Get the job DONE!

With the Construction Equipment That's Always a Step Ahead!

The operation that moves along, that's on time, that is not "hamstrung" by irritating failures of equipment... hat's the operation that gets jobs done. And that's the operation that Blaw-Knox construction equipment assures. Built into Blaw-Knox equipment are all the latest time-saving improvements, plus the strength-

where-strength-isneeded sturdiness that guards against costly break-downs and replacement of parts. Step ahead with Blaw-Knox equipment. Write or wire for full information and prices.



ROAD FORMS



CONCRETE BUCKETS



CENTRAL MIXING PLANTS



BULK CEMENT PLANTS



TRUCK MIXER LOADING PLANTS





CONCRETE FINISHING MACHINES



TAMPING ROLLERS



STEEL STREET FORMS

BLAW-KNOX

DIVISION OF BLAW-KNOX COMPAN

FARMERS BANK BUILDING . PITTSBURGH, PA.

Offices and Representatives in Principal Cities

NEBRASKA HITS THE JACKPOT - To stimulate serap collection through NEBRASRA HITS THE JACAPOT —To stimulate scrap collection throughout Nebraska an Omaha newspaper sponsored a \$2000 contest, Results were amazing. 135 million pounds of scrap was turned in—about 103 pounds per capita—setting a new pace for the nation. . . . Have you tried an incentive system to set up scrap collection in your company? In your community?



VETERAN WEAPONS DRAFTED AGAIN—This old Gatling gun and German "dud" torpedo from World War I turned up in a mid-western scrap drive. When they were cut up in the scrap yard, the torpedo yielded over 1000 pounds of steel and the gun about 500 pounds of brass and steel. . . Do you know of any war relies, of little historic value, which should be scrapped?

THE SCRAP IS COMING IN . . . BUT NOT FAST ENOUGH!

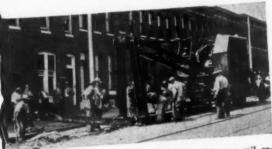
WE have proof that industry is co-operating in the drive for scrap metals... proof measured in thousands of tons. But mills must get more iron and steel scrap if they are to meet the gigantic needs of war production.

Don't forget . . . steel gets to work on the battlefront more quickly when plenty of scrap is available. Scrap is already metallic. Therefore, less ore needs to be converted into pig iron per ton of steel produced. By re-melting scrap to make new steel, more tons of high-quality products can be turned out in a hurry for war purposes.

So make it your personal war assignment to see that your organization does a thorough, continuous job of "getting in the scrap." Cooperate with your local Industrial Salvage Committee.

NEWS from the Scrap Front

TIPS FROM OTHER "WASTE WARDENS" THAT MAY HELP YOU DO A BETTER JOB OF "GETTING IN THE SCRAP"



"PAINLESS EXTRACTION" OF CAR RAILS — This new rail remover can pull up 4000 lineal feet of rail a day, its designers say. Besides speeding the salvage job, it reduces damage to savement and simplifies repaving, 60,000 tons of rail in New Jersey alone will soon a removed with this type of machine. be removed with this type of machine, . . . Is your community equipped to salvage

rails economically?

"WE PRACTICE WHAT WE PREACH"

In one of many salvage operations, a U. S. Steel subsidiary recently dismantled for scrap several of its own mill buildings no longer suited to present tons of steel scrap. Do you have any steel structures, or equipment, idle now and of should be scrapped?





AMERICAN STEEL & WIRE COMPANY, Cleveland, Chicago and New York · CARNEGIE-ILLINOIS STEEL CORPORATION, Pittsburgh and Chicago · COLUMBIA STEEL COMPANY, San NATIONAL TUBE COMPANY, Pittsburgh TENNESSEE COAL. IRON & RAILROAD COMPANY, Birmingham

STATES STEEL



TIMELY TIPS

Shovel, Dragline & Crane

You who have LIMA shovels, draglines and cranes are fortunate in having machines that are built to serve their owners throughout a long, profitable life, but regardless of how good a machine is, it requires normal servicing. Today when it is difficult to get new equipment be-cause of war work, it becomes definitely important that you give your present equip-ment proper care. To assist you in this respect we have prepared a 32 page booklet, titled, "Timely Tips for the Shovel, Dragline and Crane Operator." The booklet is full of information to help the operator get better and longer service from his machine. Your copy is ready, write for it today.

LIMA LOCOMOTIVE WORKS, Incorporated Shovel and Crane Division LIMA, OHIO

TO OWNERS AND USERS OF SHOVELS, DRAGLINES AND CRANES

Get Your Copy NOW!

LIMA LOCOMOTIVE WORKS, INCORPORATED LIMA, OHIO

Please send me a copy of your "Timely Tips" booklet.

City_

Buy war Bunds

SHOVELS, %YD. TO 31/2 YD. CRANES, 13 TONS TO 65 TONS DRAGLINES, VARIABLE



STUNFILLE BONNE MERELY adding a plow to a heavy-duty hauling Merel

MERELY adding a plow to a heavy-duty hauling truck does not make a snow fighter. Such trucks are not built to stand the punishment of ramming into 6, 8 and 10-foot drifts. Turn the job of snow clearance over to rugged, powerful Walter Snow Fighters, product of 25 years' collaboration between Walter engineers and highway officials . . . specially designed and constructed to withstand the strain and shock of drift-bucking.

Most important of all, you get the tremendous power and traction of Walter 4-Point Positive Drive. Three automatic locking differentials proportion the power

to each wheel according to its traction, assuring constantly available surfaces. Other advantages include Suspended Double Reduction Drive, tractor type transmission and many others. Write for literature giving full details.

PARTS and SERVICE FOR WALTER TRUCKS

Consult your local Walter Distributor for expert repair service and genuine parts to keep your Walter Trucks in top running condition.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood, Queens, L. I., N.Y.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood, Queens, L. I., N.Y.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood, Queens, L. I., N.Y.

WALTER MOTOR TRUCK CO., 1001-19 Irving Ave., Ridgewood, Queens, L. I., N.Y.

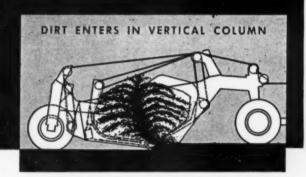
FOUR-POINT POSITIVE DRIVE

SNOW
FIGHTERS

THE DIRT "BOILS"

FOR FAST LOADING

Bucycus-Erie **4 WHEEL SCRAPERS**



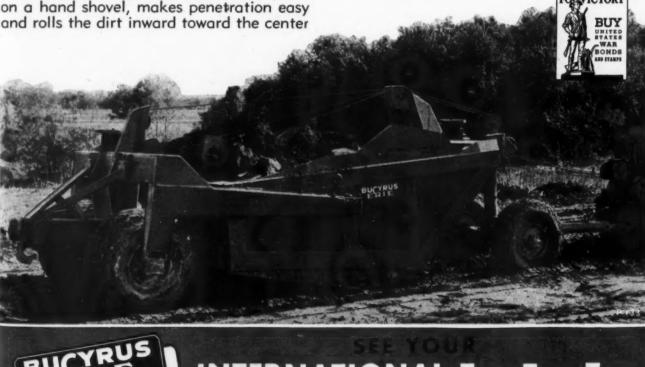
This diagram of the "boiling" action shows how the dirt flows evenly into both apron and bowl by the shortest possible route.

Bucyrus-Erie Scrapers load fast and in short distances because the cutting edge is double-curved (curved both vertically and horizontally) to "boil" the dirt up easily into both apron and bowl.

The vertical curve "curves" the dirt upward. just as the moldboard on a plow does. The dirt, entering in a vertical column, rises up through the load until it rolls out on top. Thus, you get maximum effectiveness from tractor power, because the last dirt entering the scraper doesn't have to push and pack the whole load in order to get in.

The horizontal curve, like the round point on a hand shovel, makes penetration easy of the bowl. This "rolling inward" action provides easy loading by reducing sidewall friction.

This two-way rolling action breaks up the dirt as it enters the bowl so that the scraper fills evenly with minimum voids, to give heaping payloads every time. The broken up dirt also rolls out easily for fast, freeflowing ejection. - BUCYRUS-ERIE COM-PANY, South Milwaukee, Wisconsin.





INTERNATIONAL TRACTRACTOR



TODAY — there is an unprecedented demand for planes — more planes and larger planes. These planes need large air bases with scientifically designed runways — and they need them quick — in all parts of the world.

And that is the reason for the New Pioneer Portable Aggregate Plant.

IT IS BIG — so it will turn out large tonnage — 5000 tons and more in a 24 hour day.

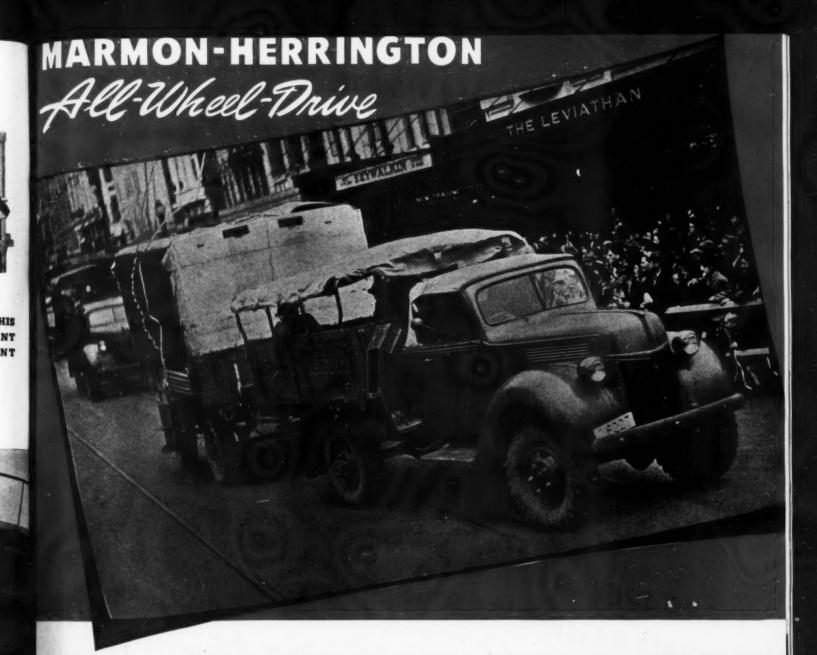
IT IS PORTABLE — so it can be moved in to the job on its own tracks and wheels — and ready for immediate action.

IT IS FLEXIBLE — so it will work in quarry, rock, or gravel pit. It will produce two or three sizes — either washed or dry. It can produce fine sand from large rocks. Ample crushers and screens permit control of the products to meet specifications.

IT IS COMPLETE — with power and all drives — pumps and piping — and conveyors to handle every set up.

IT IS THE PRODUCT of Pioneer Engineering Works, who coordinate engineering and construction for greater efficiency and better results.

PIONEER ENGINEERING WORKS · INC.
MINNEAPOLIS · MINNESOTA



"ON THE ROAD TO MANDALAY?"

- These Marmon-Herrington All-Wheel-Drive converted Fords, shown in the Australian Military Vehicle Parade in Melbourne, may be anywhere in the South Pacific, or Asia, now. But wherever they are, they are providing dependable transportation for United Nations troops.
- On sandy beaches, churned by thousands of feet and wheels, they will plough through—where "ordinary" trucks would spin their wheels in impotent effort. Through jungle mud, across streams and up mountain grades that would stop conventional vehicles in their tracks, traction on all wheels insures fast and steady progress.

le

et

ps

10

fi-

• Hundreds of Marmon-Herrington All-Wheel-Drives were shipped to Australia and New Zealand long before this war broke out in the Pacific. Hundreds more have followed since the Japs committed national Hara-Kiri by attacking the United States.

- You, who are users of Marmon-Herrington vehicles in the oil fields, in road construction and maintenance, in public utility services, etc., should be glad that your purchases of these trucks built the organization and facilities that have made this contribution to America's war effort possible.
- In MacArthur's drive up through the islands to the mainland of Asia—which is surely coming—Marmon-Herrington All-Wheel-Drives will be in the vanguard—performing the same "impossible" feats they have done for years in the world's most difficult civilian jobs of transportation.
- Invest the money you would pay for additional Marmon-Herringtons in United States War Bonds—and help speed the Victory day!

MARMON-HERRINGTON CO., the, Indianapolis, Indiana

TANK CARS ARE VITAL TO VICTORY...
"KEEP THEM ROLLING"



.. AND SPEED YOUR OWN ASPHALT DELIVERIES, TOO!

Today, unprecedented quantities of bituminous materials are urgently needed for defense highways, airports and access roads. Tank cars for asphalt deliveries are vitally important. How can these increased demands be met with the limited supply of cars available?

You can help answer that—and speed your own asphalt deliveries, as well. Keep your tank cars rolling. There are four simple ways suggested here. The Standard Oil Asphalt representative in your locality will work with you in developing plans to meet this emergency. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago, Illinois, for the representative nearest your job.

OIL IS AMMUNITION WUSE IT WISELY

ways you can help keep tank cars rolling

- 1. Accurately estimate your asphalt needs when placing yearly contracts. An extremely high estimate may force your supplier to hold large stocks and delivery facilities open which others might need.
- 2. Carefully plan delivery schedules, as far in advance as possible, so that your supplier and your railroad can be sure that transportation is available when you want it.
- **3.** Speed up unloading by scheduling deliveries when your crews and equipment are available.
- 4. Release empty cars.

Copyright 1942, Standard Oil Company (Ind.)

ASPHALT FOR STANDARD OIL COMPANY

(INDIANA)

ROADS AND STREETS

October, 1942, Vol. 85, No. 10

Double Tracking on U.S. Route 12 to Serve War Industry

Critical materials conserved and construction expedited by ingenuity in location, design and special features on a 12-mile stretch in Wisconsin

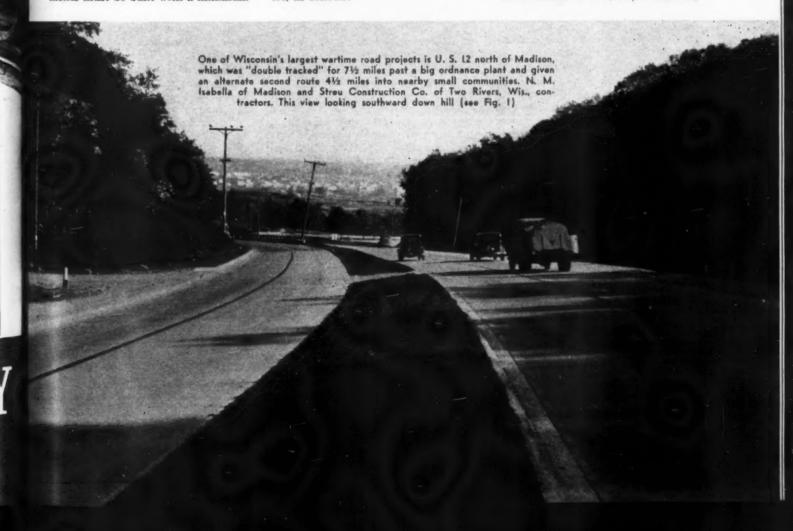
HEN a huge ordnance plant is started in a rural community, greatly enlarged access road capacity must be provided at the earliest possible moment for transporting construction workers and materials. And the road improvements must be built with a minimum

of steel and other critical materials.

These wartime requirements largely governed the design and construction of the Madison-Wisconsin Dells Road, a notable 11.8-mile project on U. S. Route 12, in Sauk County, Wisconsin. Two main contracts were let. as follows:

- (A) New parallel pavement 7.4 miles in length, connecting the existing 2-lane road past a new powder plant into a divided highway (Contract No. 2).
- (B) New location for 4.4 miles adjoining, relieving the old route into nearby small communities (Contract No. 1).

Double-tracking, beside meeting the wartime need, ended a bottleneck of long standing, by providing four lanes instead of two, on a mile-long



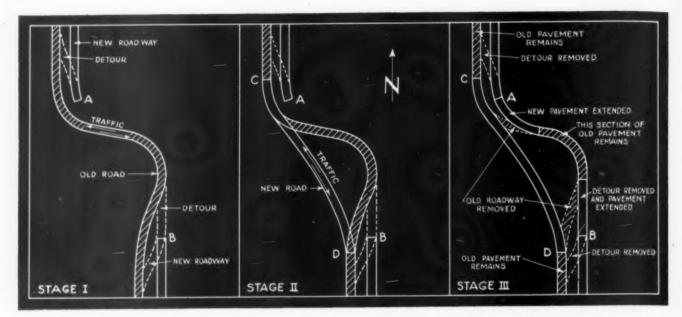


Fig. 1. Showing the three stages by which a crooked hill road was straightened and second pavement built without serious interference to traffic

6 percent grade; a third lane for trucks had been contemplated here before the war.

The highway involved is one of the most important in the state, representing a convergence for part of the distance, of three arterial roads heavily used by summer tourists. While the existing 20-ft. pavement was adequate except for the congestion from slow trucks on long grades, breaking of ground for the new ordnance works quickly showed the need for more roadway capacity. Until the new pavement was put in service, workers' cars and trucks often lined up for a mile or more at plant entrances during shift time.

Now peaks are handled without congestion, a fact that is vital to the plant operation and to the several thousand workers who converge here daily from farms and small towns, via jaloppy, share-the-ride cars, hitch-hop and bus. Even with special chartered railroad service, now provided by the ordnance plant con-

tractor, local highway traffic served by this project will run to tens of thousands of vehicle-miles daily, during the construction period and throughout the war.

The 4.4 miles of new relief road serve as a partial by-pass around two communities, valuable in peacetime to relieve congestion along business streets, and especially so now because of extremely heavy trucking of concrete materials for the ordnance plant.

Pavement Features

The new pavement consists of a 22-ft. concrete slab of 8-in. thickness, increased to 10-in. at edges and center. Not a pound of reinforcing or doweling was used in the entire project. The design, which for this reason is slightly heavier than ordinary state standard, includes a longitudinal dummy groove joint 4-in. deep to control cracking, and 3/-in. filled expansion joints at 120-ft. intervals with dummy contraction joints every

20-ft. The slab is 10-in. uniform at expansion joints.

CI

al

80

4.

fo

m

1,1

dr

to

tic

fie

Wa

for

N.

sub

801

Kr

Co.

Str

Riv N tion

fact

85 d

sode

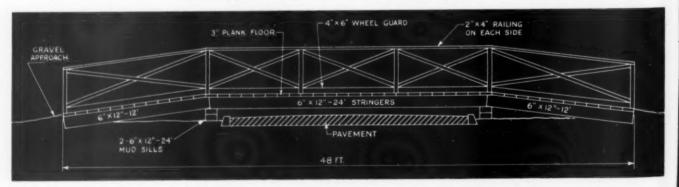
laye
34 I
com
time
Of
the

rebu long with

The 7.4-mile contract, 110,000 sq. yd. in all, includes 57,000 sq. yd. of Vinsol-Resin concrete, principally on the long grade and on curves, and 14,500 sq. yd. of Vinsol-Resin highearly-strength concrete at plant entrances, intersections and under the temporary plant-entrance cross-over bridges described below. This is the most extensive use to date in Wisconsin of Vinsol-Resin-Treated cement, which tests have shown to be advantageous in reducing or eliminating scaling due to salt and to severe freezing and thawing conditions.

Reflecting-type white cement curbs totaling about 3,100 ft. are provided along outer and inner edges where the roadways converge from divided construction to 2-lane. Standard curb and gutter is used to provide a clearly visible separation at points where the new pavement comes close to the old.

This simple timber design, plus army style "theatre-of-war" methods, enabled the contractor to have a temporary cross-over structure in service at plant entrances within two hours after placing concrete



The 4.4-mile contract comprises 51,500 sq. yd. of slab, with about 8,000 sq. yd. Vinsol-Resin treated. About 1,700 sq. yd. of 10-in. thick widening strip was built along each side of a section of old 15-ft. concrete road, built in 1916 but still serviceable.

The maximum grade on the old parallel road is 6½%; the sharpest curve, 7 degrees. On the above-mentioned long hill, the grade was reduced to 6% for both roadways, and the curvature on new work kept to 4 degrees maximum.

Drainage Structures

Of equal interest with the pavement as an example of steel conservation is the culvert design. Of three culverts or cattle passes built or extended under the new roadway, one consists of plain concrete sidewalls with rubble floor and treated timber roof, and two are plain concrete arches with rubble floor—no reinforcing whatever. The timber roof was adopted because of the limited head room.

it

q.

n

d 1-

1-

1e

er

S-

e-

be

n-

i-

bs

ed

re

ed

rb

r-

re

he

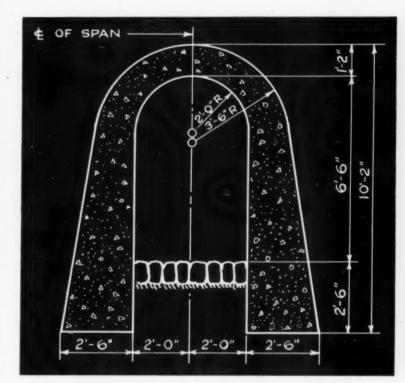
The two contracts include about 4,500 lineal feet of reinforced concrete pipe up to 48-in., ordered before the present steel conservation measures were fully adopted, and 1,100 ft. of corrugated metal side drains. (This state's culvert standards today provide for a contractor's option between plain concrete or vitrified tile incased in concrete, for small waterways, and plain concrete arches for larger structures.

Location and Construction Features

The 7.4-mile job was awarded to N. M. Isabella of Madson, Wis., who sublet the grading to P. W. Ryan Sons; the culvert work to Edward Kraemer & Sons; and 3.5 miles of grading and paving to J. R. Griffiths Co., of Racine. The 4.4 miles went to Streu Construction Company of Two Rivers, Wisconsin.

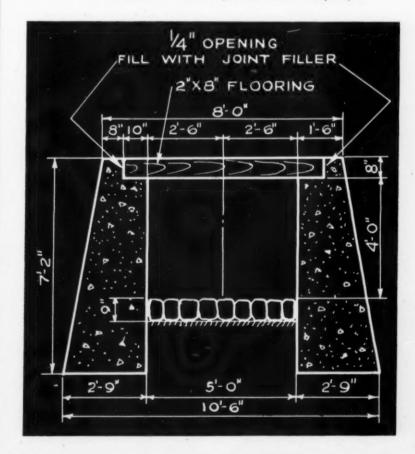
No unusual equipment or organization set-up was required despite the fact that the contract allowed only 85 days to get the new roadway open to traffic, plus another 40 days for sodding, seeding, rip rap and incidentals. Although heavy rains delayed the work, standard 27 E and 34 E paver crews, working one shift, completed the job well within the time limit.

Of particular interest, however, is the ingenious method used to build the new pavement and relocate and rebuild part of the old road up the long 6% hill at one end of the project without interrupting traffic or re-



Plain concrete "no steel" culvert, also designed as a cattle pass

Another wartime culvert. Gravity-type plain concrete walls and a treated timber roof eliminated all isteel and provided maximum capacity





Where single road T's out into divided construction, new pavement with reflecting type white coment curb and gutter was built in both directions. Old 2-lane road (darker colored) is seen at left in background

Not a bar of reinforcing in this culrent, Wisconsin's answer

Contractor N. M. Isabella







This novel treated timber-and-concrete design was used to save steel in extending a culvert under the new second roadway

Looking south down hill before both pavements were completed (Stage II in Fig. 1). Concrete pavement design is featured by complete elimination of distributed reinforcement and dowels and by extensive use of Vinsol-Resin treated cement for scale resistance



QUANTITIES AND UNIT PRICES OF CONTRACT NO. 2

Item Unit	Est. Quant	Price Bid
ClearingSta.	104	\$20.00
GrubbingSta.	89	25.00
Remov. Conc. Pav. S.Y.	7650	0.35
Unclass. Excav. (a).C.Y.	127267	0.57
		0.57
Unclass, Excav. (b).C.Y.	87234	
Exc. for StrucC.Y.	260	3.00
Borrow ExcavC.Y.	37844	0.57
Finishing RdwaySta.	405	20.00
Oblit. Old Road Sta.	12	10.00
Conc. PavementS.Y.	38623	2.68
Conc. Surf. Drains.C.Y. Gravel or Cr. Stone,	29	40.00
Traf. Br. Surf. CourseC.Y.	13299	1.50
Aggre. for Gravel or Cr. Stone Traf. Bd. Surf. Course		
in StockpilesC.Y.	1495	1.50
	5400	0.09
Salv. Surf. CourseS.Y. Conc. Masonry,		
Culv	243	25.00
Tr. Lumb. & Timb.MBM	230	175.00
Dry Rub. Masonry.C.Y.	482	7.00
Re. CCP, 24"L.F.	1355	3.75
Re. CCP, 30"L.F.	127	5.00
Re. CCP, 42"L.F.	239	7.50
Re. CCP, 36"L.F.	123	6.40
Re. CCP, 48"L.F.	165	9.20
Salv. CGSMCP 18".L.F.	226	1.25
Salv. COSMCP 16 .L.F.	290	2.00
Salv. CGSMCP 24".L.F. Temp. Crossings		
(a) Each	6	350.00
Grouted Rub. Pav. S.Y. Re. CCPSS, 12"L.F.	80 63	2.50 2.50
Inlets, Type "A" for 18" Curb and		
Gutter (a)Each Special Curb and		55.00
GutterL.F.	1238	2.10
Marker Posts (a)Each Marker Posts for	121	2.50
Right of Way (b). Each Topsoil for Seed	109	2.50
Beds and Sod-		
dingS.Y.	19217	0.19
Salv. TopsoilS.Y.	32047	0.16
FertilizerCwt.	660	3.50
SeedingS.Y.	366000	0.012
SeedingS.Y. SoddingS.Y. Intercepting Em-	19217	0.32
bankmentL.F.	4013	0.20
Culy Pine 18" L.F	210	1.75
Culv. Pipe. 24"LF	. 136	2.60
Culv. Pipe, 18"L.F. Culv. Pipe, 24"L.F. Culv. Pipe, 30"L.F. Scale Resistant	150	3.00
Conc. Pavement.S.Y. High Early Strength	57063	2.68
Scale Resistant Conc. Pavement. S.Y.	14457	2.89
White Concrete Re- flecting Curb and		
Gutter, 24"L.F.	3084	2.75

quiring any extensive detour. The old S-shaped roadway is shown (distorted) in Fig. 1. The first step (Stage I) was to bring the new pavement at either end to points A and B and build temporary roadway indicated by broken lines; then (Stage II) a new second pavement C to D was built and traffic thrown to this roadway: Finally (Stage III) the temporary roadways and old pavement sections now remaining as "cross-

overs" were removed and new pavement extended inward from B and A, completing the second roadway with a small length of old pavement left in service.

Another unusual feature was the quick erection, army style, of timber trestles to carry traffic from the ordnance plant gates over the freshly laid concrete to the old paralleling roadway. Four such trestles were required, three having a 22-ft. clear width and one, 44-ft. width. The contract specified that these had to be completed and ready to carry traffic within two hours after con-

crete was placed past plant entrances. To speed up erection, ready-cut timbers were stacked at the site and work divided into crews. One crew threw down mud sills along either side of the pavement forms and laid 6 x 12 stringers; another placed 3-in. planking, and a third gang drove spikes. These cross-overs, combined with "high-early" cement, reduced traffic inconvenience to a minimum.

Costs

The two principal contracts totalled \$717.653.19:

Contract No. 1 (4.390 miles) \$177,422.69 Contract No. 2 (7.410 miles) \$540,230.50

Estimated quantities and bid prices on Contract No. 2 were as in Table I.

Acknowledgments

The combined project, built as a strategic network improvement with approximately 75 percent federal participation, was under the direction of D. J. Minahan, Division Engineer, with W. H. Zamzow, Assistant Division Engineer in charge of construction, and R. R. Swann and E. H. Zwicky, Resident Engineers. E. L. Roettiger is State Highway Engineer.

Nationwide Gasoline Rationing to Go Into Effect November 22

Some 20 million passenger cars outside of the present gasoline rationed area will be brought under mileage rationing when the plan goes into effect, Mr. Henderson said. He estimated that mileage rationing would cut the use of private passenger cars an average of almost 60 per cent from normal.

Owners of cars in the as yet unrationed area will be required under the plan, to register and will receive a basic gasoline ration for their cars allowing 2880 miles per year at the present value of the coupons, assuming 15 miles to the gallon. The time and places for this registration will be announced later.

Additional mileage up to 470 miles a month may be obtained by the motorist who can show that the "A" book is not sufficient to meet his occupational needs, and who shows either that he has formed a car-sharing club to keep his car filled to capacity while in use, or that he has been unable to do so and that there is no other means of transportation available to him.

A special "preferred mileage" category is provided for 14 types of occupations deemed essential to the war effort and to the public health and safety. These rations issued through a "C" book, are tailored to meet the proven need, without a specific ceiling on the mileage. Tires on all cars must be submitted to OPA for on-wheel inspection every 60 days to insure proper care.

The deviations from the present ration system in the East will not be great, since the East Coast plan was designed for possible nation-wide extension as a mileage rationing plan. It already has reduced average passenger car mileage near to the objective of 5000 miles set by the Baruch report. The changes required for the rest of the country will be incorporated in the Eastern plan when nation-wide mileage rationing becomes effective so that all cars throughout the country will be operating under a single set of rules, Mr. Henderson said.

The rationing of gasoline to the 20 million additional cars in the nation will require manufacture of thousands of tons of safety paper, a major printing job, and the setting up of an extensive nation-wide machinery to issue the books and handle the supplementary applications. Local War Price and Rationing boards will be asked to augment their staffs with temporary volunteer workers to handle the extra work, and instructions for doing this will be sent to them well in advance of the registration period, Mr. Henderson said.

Supplying the necessary coupons and forms and organizing for the gigantic undertaking is a task that will require more than six weeks to complete. Orders have been placed for the safety paper and the printing of 60 million books of gasoline ration coupons, 91 million gummed sheets for preservation of the coupons as the service stations receive them from the motorists, 60 million application forms, and some 100 million copies of audit control forms, regulation books, and instruction guides and other necessary forms.

Merging of the gasoline and tire rationing programs into a single system to control mileage of the nation's passenger autos according to essentiality of use was announced Sept. 27 by Price Administrator Leon Henderson to become effective throughout the country probably about Nov. 22.

The rationing of gasoline will follow the plan now in operation for the seven and a half million autos in the East, with each of the nation's 27 million cars getting a basic A-book allowance of enough gas for 2880 miles of family necessities and occupational use for a year. Additional gasoline will be allowed only on proof of need and in quantities strictly limited to the degree of essentiality to the nation's war effort.

This gasoline rationing system will then be meshed into the tire rationing program to bring the overall mileage of America's autos within the limits of the available rubber supply, with use of tires being limited to essential transportation needs of the country. Observance of a 35 mile per hour maximum speed limit will be a basic requirement in both gasoline and tire ration allowances.

The new nation-wide mileage rationing plan has been under intensive development in OPA in anticipation of the need, since publication of the Baruch Committee's rubber conservation report on Sept. 10. These advance preparations make it possible to have the system in operation some two weeks sooner than otherwise would have been possible, Mr. Henderson said.

Fire Control and Fire Control Roads in Nicolet National Forest

PART 2

ROADS AND TRUCK TRAILS

Part I, dealing with fire control organization and methods appeared in the September number of Roads and Streets

Fire protection, forest utilization, recreational uses, and to some extent "general communication purposes" are all considered in locating the truck trails. Strategic fire coverage results in a road and trail network which leaves no point more than about 2 miles distant from some point which can be reached by truck. Where special fire hazards exist, the communication is brought much closer.

As the Nicolet Forest is almost entirely a country of gently rolling sur-

faces, there are few difficult location

problems. The most serious are due to

By LOUIS TAUSCH, JR.
Forest Ranger, Argonne District
Nicolet National Forest, Wisconsin

swamps and bogs.

While curves of 40-ft. radius, and grades up to 11% are permitted by the Forest Service, it has been unnecessary to employ such extremes in the Argonne District.

Another unused provision of the

HE Argonne District has approximately 30 miles of bituminous surface State highway, and 40 miles of County and Township roads with untreated gravel surfaces. The Forest Service has built a total of 135 miles of "Medium Service Truck Trails" in the District, a type of road designed to permit passage of light trucks and passenger autos, at speeds ranging from 16 to 25 miles per hour. Beside these, the District has approximately 120 miles of logging road, built by private interests to no specified standard but nevertheless useful for fire fighting purposes, and sometimes for recreation. Most of the logging roads are wide enough for one-way traffic only.

The "Truck Trail Handbook," prepared by the Division of Engineering of the Forest Service, is the general guide to the purpose, standards, location and construction of roads in the National Forest areas, but its provisions are made wisely elastic so that it is always possible to take advantage of local conditions.

Medium Service truck trails are made 18 ft. wide between shoulders in side hill cuts, 17 ft. in through cuts and turnpikes, and 19 ft. on fills. Occasional variations of one foot either way are permitted, but it is required that the road in general be constructed to standard. Required widths are increased 2 ft. on curves of 40 to 60 ft. radius, and 1 ft. on curves of 60 to 100 ft. radius.

Fill slopes in earth are made 1½:1. Cut slopes may be as steep as 1:1, but flatter slopes are generally used. Dimensions of side ditches are not specified, but are based on judgment of local conditions in each case.

The C. C. C., during its period of operation, contributed largely to the construction of these trails, and the complete road program of the District is now much farther advanced than would have been possible without this



U. S. Forest Service Photo
Putting a road through Nicolet National Forest

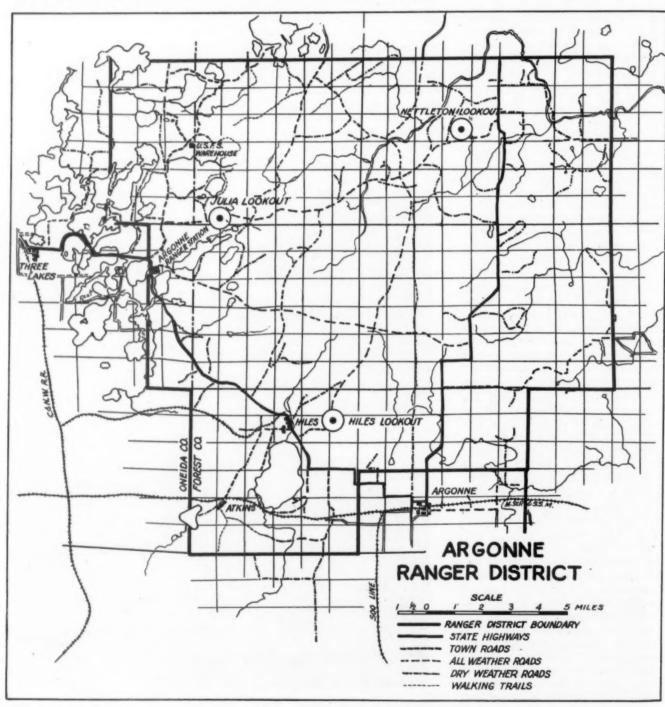
standard specifications is that of the "pitch grade," which permits an increase of 5% above normal maximum, for a distance of not more than 500 feet. Grade compensation is required on curves having central angles greater than 50°, although these requirements are not rigid. Standard reductions for an 80-ft. radius curve require that a 10% approach grade be reduced to 7% if the central angle is less than 120°, and to 6% for 120° or more. Corresponding reductions apply to other combinations of curves and grades. Curves are banked from ½ in. to 11/2 in. per ft. of width, according to radius, but again, the provisions are elastic, and the limitations of practical operation of road grading machines are recognized. Vertical curves and sight distances are prescribed.

Truck trails are located and surveyed by simple methods. The only instruments are Abney level, rod, compass and 100-ft. tape, although survey regulations provide also for stadia surveys, or transit, level and tape surveys where needed.

For reconnaissance, a good timber man is sent out to scout and blaze the route. He is supposed to follow



A Nicolet Forest gravel surfaced road just after completion. Note ditch and shoulder



Map of Argonne District, Nicolet National Forest



U. S. Forest Service Photo Road building by the CCC in Nicolet National Forest

the general principles of highway reconnaissance used by the U.S. Public Roads Administration, but because of the short lengths and rough character of the roads to be located, his work is comparatively simple.

The truck trail is fitted closely to the ground, with curvature, grades and number of grade changes much greater than would be tolerated for most highway purposes. For aesthetic reasons, tangents are seldom used in excess of 1000 ft. On the rolling ground surface of the Argonne District this is easily accomplished without any actual forcing of curves. Bridges are avoided as much as possible. A preliminary location is run and mapped in the same general manner as on other highway surveys. Tentative curves are plotted on the

Curves are staked on the ground by the method of external distances. method of middle ordinates or the method of tangent offsets. It is permissible to locate a curve of 100-ft. radius or less by describing an arc about the center, but in practice this is seldom found as satisfactory or convenient as one of the other methods. Adjustments of location are usually necessary as work proceeds, but these are simple. The line is cleared to a minimum width of 28 feet, or more, where slopes require. Slope stakes are not generally set on our work.

The prevailing soil of this district is a sandy clay-easily worked, and of itself a fair road building material. The only rock is an occasional glacial boulder. Gravel is fairly plentiful in scattered and irregular beds. Some of it is usable in the pit run con-

The trailbuilder is the all-important construction tool. Trees of more

than 8-in, diameter are cut ahead of it, and the larger stumps are removed, but the trailbuilder is depended upon to root out everything smaller, and to rough out the grade completely.



U. S. Forest Service Photo CCC boys spreading gravel surface

Beside the operator, about 10 men are generally employed to handle brush and small trees which have been uprooted, to remove stumps and to do miscellaneous grubbing and trimming. Large stumps are blasted.

A heavy road grader, pulled by a 50 h.p. tractor finishes this part of the job.

Major items of road building and maintenance equipment are:

At Argonne Station:

- Argonne Station:
 International stake truck, 1½ ton
 Dodge stake truck, 1½ ton
 Dodge pickup truck, ½ ton
 Chevrolet pickup trucks, ½ ton
 Galion, 12 ft. motor grader
 Adams, 12 ft. pull grader (hydrocontrol) control)
- Isaacson, 3-tooth road ripper
- Adams rotary fresnos
- Allis-Chalmers, 25 h.p. tractor
- (chiefly for fire services) Cletrac, 35 h.p. tractor (chiefly for fire services)

Available from Nicolet Forest Headquarters at Rhinelander

- Gar Wood trailbuilder
- Caterpillar, 50 h.p. tractor P & H ¼-yard shovel
- Dragline
- Lippman rock crusher
- Cletrac, 55 h.p. tractor, with double cable drum for dragline
- 1 Gar Wood, 8-yard scraper

The above items of equipment are repeated from the lists given in Part 1 of this article, which also included fire fighting equipment.

The completed sub-grade is covered with 6 in. of gravel. In no instance has it been necessary to haul this material more than 6 miles. Much of the gravel used is merely pit-run, with stones in excess of 2 in, forked out, In other cases it has been advisable to install a crushing and screening plant. The Forest Service owns a Lippman Crusher, which has been used in this service and moved from place to place as necessary. The gravel is dumped on the grade between guide boards 6 in, high, held loosely in place by iron rods. It is spread from the dump truck and evened off by hand to proper level and crown, and left to be compacted by traffic.

While the Truck Trail Handbook contains instructions for preparing designed mixes of clay, sand and (Continued on page 62)



U. S. Forest Service Photo

Out with it!



5-MILE ROAD 700,000 CU.YD.

EAVY rock excavation featured the construction of a 4.9 mile section of State Highway 80 in Imperial County, California, between Mountain Springs and Millers.

The first contract, covering grading and surfacing 3.6 miles of highway was awarded to the Denni Investment Corporation, Wilmington, California. Work was started on September 4, 1940 and the contract has been completed. The second contract covering 1.3 miles of highway also was awarded to the Denni Investment Corporation. This job includes 258,000 cu. yds. of roadway excavation, 40,500 cu. yds. of channel change and 1,595,000 station yards overhaul.

The two contracts amount to approximately \$700,000. The total quantities on the two jobs will exceed 700,000 cu. yd., mostly rock.

State Highway 80 is the only outlet from San Diego to the Imperial Valley. Mountain Springs is a historical place. It was here on Thanksgiving Day, 1846, a troop of U. S. Cavalry made its camp. These were the first Americans to travel this trail.

General Conditions

Construction operations on this job have been carried out under somewhat difficult working conditions. The temperature in summer is well over 100° for days at a time. Water was brought to the job from wells at Jacumbi, this requiring 13½ miles of 4-in. pipe. The pumps and line are maintained by the contractor. Two 2-hour shifts have been used practically all the time.

The project included the construction of several deep cuts. The principal one was 400 ft. long, 158 ft. deep, and required 148,000 cu. yd. of excavation.

This cut was no ordinary run of the mill job, and consequently the method of handling it was closely watched by a number of contractors.

JOB REQUIRES EXCAVATION

The first operation was to pack explosives to the top on the backs of mules. After the top had been shot a Caterpillar DK8 tractor with bulldozer was started up on a 45 per cent grade. It took four days to work a trail up to the top with this tractor. After bulldozing off the top of the cut, a Lima shovel was moved in and worked its way to the top by digging switchbacks at about 22 per cent grades. Loading was then started, the material being hauled down by Koehring dumptors. At the turn in each switchback a sort of landing was made for passing purposes. The movement of the dumptors were timed so perfectly that the only possible chance to pass was at the landings at the end of the switchbacks.

Equipment

The equipment used on the job was as follows:

- 1—Lima Type 750 shovel, powered with D-1700 Caterpillar Diesel engine.
- 2—RD8 Caterpillar Diesel Tractors, with
- 12—Gardner-Denver hammer drills, Model S55. (These hammers were used due to roughness of the terrain. Wagon drills were not feasible.)
- 4—Koehring Dumptors (6-yd. capacity), powered with 4 cyl. General Motor Diesel engines.
- 3—Gardner-Denver air compressor (365 cu. ft. capacity each), powered with D-13000 Caterpillar Diesel engines.
- Timken detachable drill bits were used.
 These were sharpened by the hot
 milling process thus making it possible to use the same bit at least 8
 times. Hercules powder was used exclusively. The Shell Oil Company
 serviced the job.

Personnel

The contract was carried out for the Division of Highways, Department of Public Works of the State of California. The work for the contractors was in charge of Harry Davis, general superintendent. Lewis Newman was master mechanic and John Munn, walking boss. The Denni Investment Corporation has its main offices at 736 Avalon Blvd., Wilmington, California. Joseph A. Denni is president.





Above: This cut required 148,000 cu. yd. excevation. It is 158 ft. high and 400 ft. long

Right: Casting

Below right: Harry Davis, General Sup't., Denni Investment Corporation

Below: Removing blasted rock from highway. New highway runs along here, and traffic goes through. Traffic is held not longer than 40 minutes at a time





f f c re e n st re re be 10 on di ca

wa dis by ch be pla th of in

ROADS AND STREETS, October, 1942

Six New Roads for War Purposes

Russia, China, India, Canada-Alaska, Mexico-Central America, Australia

INCE the Japanese began their conquest of China five years ago, at least six long military roads have been built or have been begun. They are (1) the Burma Road. (2) the one now building to the north of it, (3) the Australian road to Port Darwin. (4) a road to Baku on the Caspian Sea, (5) the Canada-Alaska road, and (6) the Mexico-Central America road. On July 27 it was announced that pioneer roads 625 miles long will close gaps between existing roads from the terminus of the Mexican railway to the Panama Canal. These pioneer roads will be surfaced with gravel.

It is probable that some long military roads have been constructed or reconstructed in Russia since the war began, and that still others will be built if the Germans advance much farther; for modern warfare, with its thousands of mechanized vehicles, requires roads as never before.

Military leaders the world over have been slow in recognizing this fact. They have been slower in appreciating the rapidity with which long roads can be built with powered equipment. The Alaska-Canada road, now under construction, is an outstanding object lesson that is apt to revolutionize military practice in this respect; for since that wilderness can be spanned with a good pioneer road 1000 miles long within a period of 9 or 10 months, it follows that the less difficult terrain across Central Africa can be spanned with a road in a year.

Opportunity in Russia

It follows also that capture of railway lines in Russia need not be as disastrous as might be supposed; for by using American road-building machinery, long military highways can be quickly constructed to take the place of railways. In the rush to get planes, trucks, tanks and cannon to the Russians, there is grave danger of overlooking the necessity of building roads to take the place of rail-

By HALBERT P. GILLETTE

Reprinted from Los Angeles Times

ways and roads that may fall into German hands.

Rostov, terminus of a railway to Moscow and another railway to Baku, is again occupied by the Germans. Before the fall is over the entire railway line from Archangel through Moscow to Rostov may be either controlled by Germans or cut in so many places as to be useless to the Russians. Then nothing will be left but roads for feeding equipment and supplies to the embattled millions of the Soviet.

Amazing Development

The first magazine specializing solely in highway construction was founded just 50 years ago in America, with the title Good Roads. In the half century that has elapsed, there has occurred a development in grading and road-building machinery, or equipment as it is commonly called, that is amazing. Practically all this development has been American. Manufacturers in other nations have sometimes copied but have added nothing to the efficiency and capacity of any type of our road-building equipment.

As America is the leader in automobile and truck manufacturing, so it is the leading manufacturer of machinery for building the highways over which our 30,000,000 motor vehicles run. Our annual production of these vehicles normally has been four times that of all the other nations combined, 15 times that of Germany and 24 times that of Russia! Probably our annual output of road-building equipment has been in about the same ratios to those of other countries.

To an American road builder photographs of thousands of Chinese building the Burma Road have been a pathetic spectacle. Their only power was that of human muscles, not even a donkey to aid them in the grueling task of grading. Probably they are working now in the same puny way building their "second Burma Road," having lost the first one to the invaders, while we do nothing to aid them.

As a significant side light, bumptious Japan has only about 30,000 motor vehicles, or one-thousandth as many as we have, and poor China and India have so few that the number is not even listed in the World Almanac. The combined population of these two countries is about five times ours. In India their labor unions are the most powerful in the world, and among the most ancient. They are called castes.

African Road

In a recent article I advocated building a road across Central Africa about 500 miles north of the Equator from the Gulf of Guinea to the Nile, thence northward to Berber on the Nile, terminus of a railway to the Red Sea at Suakin and Port Sudan. The route of this proposed road lies in a well-watered zone, and construction can be carried on every month of the year. It would save about 8000 miles of ocean transportation to Egypt as well as to Iran and India. About a year ago some 200 planes a week were being flown from Freetown and Lagos, where they had been unloaded and assembled, to Khartoum and thence to Cairo. The route of flight was not far north of the proposed African road to Berber via Khartoum .The railway from Berber to the Red Sea may not have the desired carrying capacity, in which case a road would have to be built along it.

It is planned to build a ship canal across Florida. Compared with a trans-African road its value for war purposes is almost nil. Moreover, the war will probably be over long before the canal is finished. But there are no Congressmen from Africa.



N 1870 the City of Brookline, Massachusetts, spent \$17,000 for its first large-scale installation of sidewalks. Wooden planking was then the only material available and suitable at a practical price. The wood was native spruce, from the surrounding area. These planks, unlike the usual boardwalks, were laid end to end in direct contact with the ground and nailed to depressed crosspieces. Upon weathering, they bleached to a silver grey, and their harmonious effect, flanking the rock walls and hills of residential streets became a subject of note to architects and city planners.

Then, as now, Brookline ranked as one of the most aristocratic suburbs of aristocratic Boston. In 1897 it was said to have the greatest per capita wealth of any city in the world. To-day, in spite of apartment houses and commuters and traffic problems, it is still wealthy, conservative, and—aristocratic. And it still has wooden side-

"More modern" footways have, of course, come in, and today's five miles of wood is a minor fraction of the total. But that five miles is located where people care most for the charm of their surroundings.

It is unfortunate that detailed cost records are not available as this is written, but a brief historical review is significant. When officials in the early 1900's started a gradual replacement of plank with cement and asphalt, there was opposition to the change. The officials countered by pointing out that though the initial cost of wooden walks might be low,

upkeep was high. Termites and decay made the planking worthless in three or four years and necessitated expensive repairs. The controversy continued until 1930, when the adoption of chemically treated lumber brought a solution which is still in effect, and is understood to be satisfactory to all parties. The present walks, all of which are made with Wolmanized lumber, retain the beauty of the natural wood, and have a life, according to Mr. Daniel G. Lacey, superintendent of the Brookline highway department, not less than three times that of the untreated natural material. In fact, it is reported that the treated lumber installed in 1930 is still in service, and appears good for an indefinite period to come.

Select merchantable 2-in. x 8-in. Douglas fir, in 12-, 14-, and 16-foot lengths, planed on the top side only, has given the best mechanical wear, in the opinion of Henry Smith, assistant to Mr. Lacy, and directly re-



ee non ht nd all of ed atng idrtnat In ted in in-

oot aly, ear, asresponsible for the care of sidewalks. Most of the 165,000 f.b.m in the present walks was treated at the Westboro plant of the American Lumber and Treating Co., about 40 miles from Brookline. The design is substantially the same as in the earliest years.

Mr. Smith, in discussing the installation, pointed out that with treated lumber lasting three times as long as untreated, the saving in annual labor cost ranks with the saving on material.

Brookline, it may be noted, has a population of about 50,000, a tax rate about half that of its mother city, Boston, and a government based on a modification of the early town-meeting plan of New England. It was one of the few cities of its size to have no traffic deaths in 1940.



The Borrow Pit

¶ Two men were discussing prenatal invence and one said he didn't believe in it—that it was all nonsense.

"Before I was born," he declared, "my mother was terribly frightened by a record in a coin phonograph and it didn't affect me in any way—in any way—in any way—in any way."

¶ Fred Astaire says the only reason why he doesn't sing at United States Army camps is that the soldiers have guns.—Boston Globe.

¶ He: I'm not feeling myself tonight. She: You're telling me!

¶ Sentry: Halt, who's there?

Voice: American.

Sentry: Advance and recite the second verse of "The Star-Spangled Banner."

Voice: I don't know it. Sentry: Proceed, American.

¶ Office Boy: "Sir, I think you are wanted on the telephone."

Employer: "You think! What's the good of thinking? Don't you know?"

Office Boy: "Well, sir, the man on the line said, 'Hello, is that you, you old goat?' "—Northern Lyon County Journal

¶ Officer: "What's the big idea? What are you men doing climbing trees and crawling through the bushes?"

Private: "Well, sir, we camouflaged the gun before lunch, and now we can't find it."—*Underwriters Review*

A young R. A. F. officer stationed somewhere in Egypt was flying near the great Pyramid, carrying out exercises in navigation and discovering his geographical position with a sextant. After a series of involved and confused calculations, he turned suddenly to his pilot and said, "Take off your hat!"

"Why?" asked the pilot.

"Because, according to my calcula-

tions, we are now inside St. Paul's Cathedral."—The Modern Woodman

This is the one about the stripteaser who had a Vassar pennant on her undressing room wall, a collection of Toscanini records and an original Picasso. As she sat there being interviewed (in her birthday clothes) the newsman asked for an explanation.

"Well," she well'd, "I graduated from Vassar. My father got the Toscanini recordings from a music critic friend, and I got the Picasso on my last trip with him to Paris. "But I don't understand," almost wept the reporter. "How did you ever happen to get into this naked business?"

"Oh," she shrugged, "just luck."

¶ Army Doctor: "Weak eyes, eh? How many lines can you read on that chart?"

Draftee: "What chart?"

¶ Then there's the story of the lawyer who sat up all night trying to break the widow's will.—The Yellow Strand.

AHOY CONTRACTORS, IS THIS THE SECTION OF CULVERT PIPE YOU LOST?

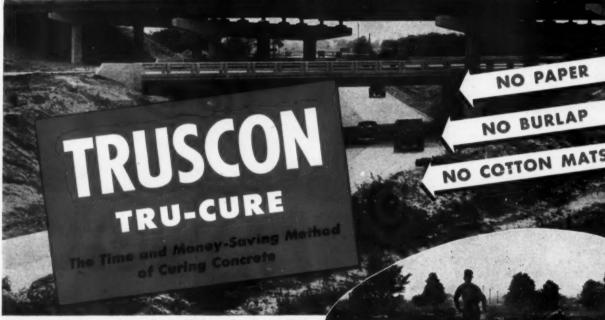


Courtesy Toncan Culvert Manufacturers Association

You hoo dearie, look what I won from that nice highway engineer

Over 96% WATER RETENTION at 100°F

Spray It On and the Curing Job is Done



Tri-level Grade Separation on Super-Highway Leading to Willow Run Bomber Plant. All Concrete Cured with TRUSCON TRU-CURE.

Designed to meet the emergency war requirements of speeding up concrete construction, TRUSCON TRU-CURE also provides

- -Stronger concrete (higher compressive strength).
- -Harder concrete (greater wear resistance).

g

- -Sounder concrete (freedom from checks and cracks).
- More serviceable concrete (minimum maintenance necessary).
- More water-tight concrete (greater resistance to freezing and thawing).

TRUSCON TRU-CURE provides this better concrete because it acts as a sealer, retaining the original mixing water in the concrete to insure uninterrupted and complete curing of the concrete. TRUSCON TRU-CURE provides over 96 percent of water retention at 100°F in the first twenty-four hours.

WRITE FOR LITERATURE to Dept. R-4 on this advanced method of curing concrete that saves time, labor, material — and does a better curing job.

TRUSCON TRU-CURE
Is Applied to the Wet
Concrete Immediately
Following the Finishers.

TRUSCON TRU-CURE is applied immediately after finishing. Equivalent to a 14-day water cure.

Clear liquid—will not discolor concrete. No cleanup afterwards. No need for bulky curing material nor time and labor cost of handling.

Approved by United States engineers.

TRUSCON
LABORATORIES DETROIT

ROADS AND STREETS, October, 1942

BRUTE LUNGS, BUT NO BACK-TALK ...



Look into the vitals of this Worthington Blue Brute Compressor and get a new angle on lung-power! All muscle, you'll say, and plenty of it. Then start it up and listen to the way it breathes!

You'll find that this Brute's smooth delivery through Worthington Feather* Valves will get your next job done more quickly, more safely, more economically—without the air-gulping "back-talk" and whining of lesser breeds.

All Worthington Blue Brutes save air. Blue Brute Compressors . . . portable and semi-portable, gasoline-driven, diesel or electric . . . deliver more air for every power-dollar you spend. And Blue Brute

Air Tools use less air for every compression-dollar invested.

Now's the time to investigate those Blue Brute features that give you extra lung-power, extra stamina — over and above the rock-bottom fact of Blue Brutes' tip-top quality.

FREE EQUIPMENT-SAVER SPEEDS VICTORY

Save tools, time and money, by getting Worthington's new EQUIPMENT-SAVER, complete instructions for all tool operators. Your nearest Worthington distributor, listed on page 53, will supply you. If there is none near you, write for it direct to Holyoke.

On the Job with

BLUE BRUTES

A western construction man writes: "Have sent in order for some spare parts but I think that I won't have to use them. All three BLUE BRUTE compressors that I have do not give one minute's trouble and operate as perfectly as they did when they first came on this job."

* Reg. U. S. Pat. Off.

Get more WORTH from air with WORTHINGTON Buy Blue Brutes



Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have

always set the pace for easy operation — available in a wide range of weights and sizes,

WORTHINGTON

Worthington Pump and Machinery Corporation, Harrison, N. J. Holyake Compressor and Air Tool Department, Halyake, Massachusetts

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools. Get your **EOUIPMENT-SAVER - FREE**

see full page ad page 52

ALABAMA

Birmingham — Ed Gantt Machinery Company ARIZONA ARIZONA
Phoenix — Smith Booth Usher Company
ARKANSAS—Fort Smith — R. A. Young & Son
Little Rock — R. A. Young & Son
CALIFORNIA - Smith Booth Usher Company Los Angeles COLORADO COLORADO
Boulder — Standard Machine Works
CONNECTICUT
Hartford — The Holmes-Talcott Company
GEORGIA
Atianta — Tractor & Machinery Co., Inc.
ILLINOIS — Chicago — Nenneuy-Cochran Co.
Rock Island — Western Equipment & Supply Co.
INDIANA
Indiannapolis — Reid-Holcomb Company
IOWA — Des Moines — Electrical Eng. & Constr. Co.
KENTUCKY — Harlan — Hall Equipment Sales
Louisville — Engineering Sales Company
LOUISIANA
New Orleans — Wm. F. Surgi Equipment Company
MAINE — Ellsworth — Murray Machinery Co.
MARY LAND
Baltimore — D. C. Elphinstone, Inc. Standard Machine Works

MAINE — Ellsworth — Murray Machinery Co.
MARY LAND
Baltimore — D. C. Elphinstone, Inc.
MASSACHUSETTS
Boston — P. I. Perkins Company
Cambridge — W. W. Field & Son, Inc.
MICHIGAN
Detroit — W. H. Anderson Company, Inc.
MINNESOTA
Minneapolis — The George T. Ryan Company
MISSOURI
Kansas City — Machinery & Supplies Company
St. Louis — Webster & Hedgeock Tr. & Eq. Co.
MONTANA— Helena — Caird Engineering Works
NEBRASKA
Lincoln — Highway Equipment & Supply Co.
NEW JERSEY
Irvington — Smith Tractor & Equip. Co., Inc.

Irvington — Smith Tractor & Equip. Co., Inc.
NEW MEXICO
Albuquerque — The Harry Cornelius Company
NEW YORK

Albuquerque — The Harry Cornelius Company
NEW YORK
Albany — Larkin Equipment Company
Binghamton — MacDougall Equipment Co.
Buffalo — Dow & Company, Inc.
Corona, L. I. — The Jaeger-Lembo Machine Corp.
Glens Falls — Collin, Fox Co., Inc.
Middleton — S. T. Randall, Inc.
New York — Mubbard & Floyd, Inc.
New York — Morris Park Construction Co.
Olean — Freeborn Equipment Company
Onconta — L. P. Butta, Inc.
Syraouse — Harrod Equipment Company
Troy — Briggs Machinery Company, Inc.
NORTH CAROLINA
Durham — Constructors Supply Company, Inc.
OHIO — Checinnati — The Finn Equipment Company
Marietta — Northwest Supply & Equipment Co.
Toledo — M. W. Kilcorse & Company
OKLAHOMA
Okhkor Chr. — Townson Equipment Co.

1 oledo — M. W. Kilcorse & Company OKLAHOMA Oklahoma City — Townsco Equipment Co. OREGON

OREGON — Andrews Equipment Co. OREGON — Portland — Andrews Equipment Service PENNSYLVANIA — Easton — Sears & Bowers — Harrisburg — N. A. Coulter Oil City — Freeborn Equipment Company Philadelphia — Metalweld, Inc. — Pittsburgh — John McC. Latimer Company Wilkes-Barre — Ensminger & Company SOUTH CAROLINA — Columbia — Bell-Lott Road Machinery Co. SOUTH DAKOTA Sioux Falls — Empire Equipment Co. TENNESSEE — Chattanooga — James Supply Company

TENNESSEE
Chattanooga — James Supply Company
Knoxville—Wilson-Weesner-Wilkinson Co.
Memphis — Tri-State Equipment Company
TEXAS — Dallas — Shaw Equipment Company
Houston — McCall Tractor & Equipment Co.
San Antonio — Patten Machinery Company
VIRGINIA. VIRGINIA

d - Highway Machinery & Supply Co. Seattle — Star Machinery Company
WEST VIRGINIA
Fairmont — Interstate Engineers & Constructors
WISCONSIN
Eau Claire.

WISCONSIN
Eau Claire — Bradford Machinery Company
Green Bay — Nelson Machinery Company
Madison — Western Equipment Company
WYOMING
Cheyenne — Wilson Equipment & Supply Co

- Wilson Equipment & Supply Co.

Get more WORTH from air with WORTHINGTON

Bur Bue Barres

Worthington Pump and Machinery Corp.

Used Construction Equipment Order as Amended Sept. 28

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of rubber and other materials used in the production of construction equipment for defense, for private account and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

3053.1 Limitation Order L-196—(a) Applicability of priorities regulations. This order and all transactions affected thereby are subject to all applicable provisions of the priorities regulations of the WPB, as amended from time to time, except to the extent that any provision hereof may be inconsistent therewith, in which case the provisions of this order shall govern.

(b) Inapplicability of this order. This order shall not apply to the Army, Navy, Maritime Commission or to any person or agency who has acquired used construction equipment for export outside the continental limits of the United States.

(c) Definitions. (1) "Person" means any individual, partnership, association, business trust, corporation, governmental corporation or agency, or any organized group of persons, whether incorporated or not, except those excluded by paragraph (b) hereof.

(2) "Construction equipment" means any of those products listed in Schedule A attached hereto and made a part of this order.

(3) "Used" when applied to construction equipment means any construction equipment which has been delivered to an ultimate consumer.

(d) Registration of used construction equipment. Any person owning used construction equipment purchased prior to Oct. 1, 1942, shall on or before Oct. 31, 1942, register such equipment by completing, signing and returning by mail WPB Form 1159 to Used Construction Equipment Regional Specialist in the WPB Regional Office in the region in which such equipment is located.

(e) Registration of change of status of used construction equipment. Within one week after any used construction equipment (1) is moved from the project on which it is being used: (2) becomes idle after completing its work on that project even if not moved from the project; (3) not being on

a project is put into use on a project; or (4) has had its ownership changed, any person owning such equipment shall register such change of status by completing, signing and returning by mail WPB Form 1333 or such other form as may be in the future specified by the Director General for Operations to Used Construction Equipment Regional Specialist in the WPB Regional Office in the region in which equipment is located.

(f) Records. All persons affected by this order shall keep and preserve for not less than two (2) years accurate and complete records concerning the movement of used construction equipment from projects.

(g) Audit and inspection. All records required to be kept by this order shall, upon request, be submitted to audit and inspection by duly authorized representatives of the WPB.

(h) Violations. Any person who wilfully violates any provision of this order, or who, in connection with this order, wilfully conceals a material fact or furnishes false information to any department or agency of the United States is guilty of a crime and upon conviction may be punished by fine or imprisonment. In addition, any such person may be prohibited from making or obtaining further deliveries of, or from processing or using material under priority control and may be deprived of priorities assist-

(i) Appeal. Any person affected by this order who considers that compliance therewith would work an exceptional and unreasonable hardship upon him, or that it would result in a serious problem of unemployment in the community, or that compliance with this order would disrupt or impair a program of conversion from non-defense to defense work, may apply for relief by addressing a letter to the WPB Regional Office in the region in which the equipment is located setting forth the pertinent facts and the reasons why such person considers that he is entitled to relief. The Director General for Operations may thereupon take such action, if any, as he deems appropriate by the amendment of this order or otherwise.

(j) Communications. All communications concerning this order shall be addressed to Used Construction Equipment Regional Specialist in the

(Continued on page 87)

Bituminous Runway Construction

Special Process Used at Winnebago County Airport, Oshkosh, Wisconsin, Permits Application of Asphalt to Damp Aggregate

HE old Oshkosh airport, a private institution with a 100-acre field, was purchased by Winnebago County in 1940, together with some 200 acres of adjacent farm land, for development as a modern flying field of approximately 300 acres. The total cost of land was \$75,692 (slightly more than \$250 per acre) of which

By JOHN C. BLACK

Field Editor, ROADS AND STREETS

\$75,000 was paid for the property, while the balance of \$692 was for incidental costs.

Work now drawing to a close involves the construction of 10,750

Traveling mixer-Barber-Greene-coming down windrow on which lime has been spread



Four motor graders blading surface course on runway—one Adams No. 311, one Adams No. 511, one Caterpillar No. 12 auto patrol and one Caterpillar No. 212

linear feet of runway divided as follows:

East-W	est runw	a,	y		0	9				0		0		D		.3750 ft.
North-S	South ru	m	V	78	13	ÿ		D		0		0	۰	۰		.2500 ft.
NE-SW	runway						0			0		0	0			.2600 ft.
NW-SE	runway		۰	0	0		0	0		0	8				0	.1900 ft.

All runways are 100 ft. wide, and the total area is approximately 120,000 sq. yd. Plans provide for a future widening of runways to 150 ft. by the addition of 25 ft. on each side. All of this development is located within an area of about 200 acres, the remaining 100 acres being held for such future use as circumstances may dictate.

During the construction period the old airport has been kept in service as a primary station for CAA fliers. This has involved some slight distractions, as the small ships are continually taking off and landing in the immediate vicinity of the work. At one point a temporary gap of about 200 ft. has been left in a new runway to permit taxi-way for the training planes.

Grading for the new field totals 120,000 cu. yd., of which 100,000 yards was completed prior to Sept. 1, 1942. It is planned to do the remainder of this work as soon as the appropriation of the necessary money has been received.

Cost of Work

Development of the new port is being carried out as a W.P.A. project to CAA specifications by the County Airport Committee of five members, appointed by the Chairman of the County Board, and approved by the Board acting as a unit, in 1940.

All of these sums were for work on the 200 acres under immediate development.

Grading of field and runways cost approximately 30c per cu. yd., while the pavement, including the 9-in.



(All weighed-in on the platform scale, another Mackload of coal gets the go-ahead and rolls away. Sketched from life, near Scranton, by Peter Helck.)

Well-known American, at work!

THE SAYING "Built like a Mack Truck" is something more than a slang phrase. It is an acute observation on the difference between a Mack... and just a truck! It worked into the language because of the way a Mack works into a job. The first Mack, built in 1900, served 17 years. No one knows... yet... what records today's Macks will make. But you can put it down as sure that the first Mack, today's Mack, tomorrow's Mack... all set out to be the best trucks in the world when made!

Mack Trucks, Inc., New York, N. Y. Factories at Allentown, Pa.; New Brunswick, N. J.; Plainfield, N. J.; Factory branches and dealers in all principal cities for service and parts.

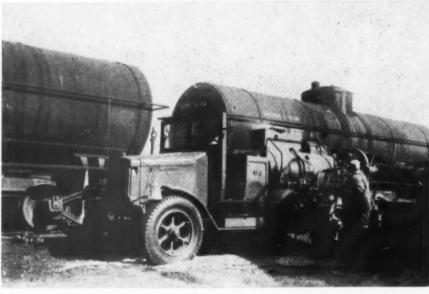


IF YOU'VE GOT A MACK, YOU'RE LUCKY...IF YOU PLAN TO GET ONE, YOU'RE WISE!

ROADS AND STREETS, October, 1942



Spreading 9-inch base course with Adams No. 311 tandem motor grader



For heating asphalt, a William Bros booster on International truck is used



Looking down a runway during surface course construction

base and 3-in. black top totalled 80c per sq. yd. complete.

All material is furnished by the County and W.P.A., and all work is by day labor except the mixing of the top coat of runway surface, which latter was contracted by the Badger Surfacing Co. of Oshkosh at 50c per ton. Grading was done with County equipment, leased by the Project at the standard State rates. Likewise, County trucks, motor graders, bituminous distributors and roller, rented on the same basis, were used to construct the runway surfaces. All equipment was rented "with operator," so that only experienced men were employed on machines.

Drainage and Subgrade

Soil at the airport is a red clay which becomes very soft and sticky when wet. Drainage is provided by full-coated perforated Armco corrugated pipe laid parallel to each runway at a distance of 25 feet from the edge of the present pavement to allow for future widening as previously mentioned. Total quantities of pipe are:

6-1	in.	perf.	pipe		0	0	0	0		0		.6,270	lin	ft.
8-	40	68	64									.4.915	**	64
10-	44	64	66		*	*				-		.3,750	64	44
12-	66	6.6	66									.1,270	60	66
15-	68	68	64									.2,185	86	66
18-	44	4.6	68									. 160		66
24-	44	44	44									000	66	6.6

In addition to this, there is a run of 920 feet of 30-in. reinforced concrete. Discharge is into an existing 5-ft. trunk sewer. All drain pipe trenches are filled with crushed stone from a point 6 in. below the pipe to the top of the trench.

Subgrade for pavement was finished by motor grader.

Two-Course Pavement

The pavement is laid in 2 courses—a 9-in. base and 3-in. surface. Aggregate for both is a hard crushed limestone weighing 2600 lb. per cu. yd., obtained from quarries of the Oshkosh Stone and Lutz Stone Co., about 2 miles away.

The base stone ranges from 3-in. down to ½-in. size.

This very open type was selected in order to avoid the capillary raising of water which would occur with denser grading. To the writer it appeared that the grading was inadequate, and that larger proportions of small stone (at least down to the ½-in. size) would have given better keying and needed stability without greatly increasing capillarity. After the base was rolled, it was treated with 0.4 gallon of tar prime which penetrated from 1 to 1½ inches, but not generally farther.

The surface is a 3-in. course of



TECO System of construction shows way to Elegance, Economy, and Rigid Strength under city traffic.

Eye-appeal was an essential . . . the bridge had to be easy on the exchequer . . . and capable of sustaining an H-15 traffic loading plus forty tons of concrete pavement — without deflection or vibration.

This bridge, now in service in Portland, Ore., amply fulfills these requirements.

TECO Ring Connectors endowed the joints with great strength while reducing, at the same time, the size of the timber members. Prefabrication under the TECO System saved time, labor, and money. No falsework was needed to erect it. And, a single crane did the job.

Write today for full details.



TECO Ring Connectors spread the load on a timber joint over practically the entire cross-section of the wood.







Timber ENGINEERING COMPANY

PORTLAND, OREGON



Rolling the first one inch of surface coat with 10-ton Galion tandem



Plant of Lutz Stone Co., who furnished crushed limestone. The quarry is just to left



Left to right: Burt Hosterman, President, Badger Surfacing Co.; Leon Morrissey, Winnebago County Patrol Superintendent; Ken Sayler, Resident Engineer

ROADS AND STREETS, October, 1942

crushed stone and asphalt, with a treatment of a proprietary material known as "Kotal" and lime to insure adhesion and internal cohesion. Aggregate meets the following specifications:

3/4-in.	openin	K				۰			e					0	Passing 100%
1/2 -in.	**	_		9	0	0	0				0	0	0	0	87-100%
3% -in.	86														75- 97%
No. 4	sieve				0			0	۰	0		0	0		55- 91%
No. 16	44										0		٠		34- 71%
No. 50															19-43%
No. 200) "														5- 12%

Aggregate is dumped from trucks in three lines 33 ft. apart, after which it is shaped by a motor grader into uniform windrows containing 0.4 cu. yd. per linear foot.

Asphalt Grades

Asphalt for this course is MC-3 cutback, obtained from the Andresen Corp. of Chicago, and delivered in tank cars on a siding about 11/2 miles from the field. It is a product of the Lion Oil Refining Co. of Eldorado, Arkansas. Steam for the tank car coils is furnished at 120-lb. pressure by a William Bros booster mounted on an International truck. Heating coils in many of the cars are inadequate, and when air temperatures are down in the 40's or 50's, it sometimes requires as much as 18 hours to raise a car to the required 200 degrees. The temperature is raised to 250 degrees after the asphalt is delivered to the tank wagon.

t n 1 t: n ii

0

a

m

ir

is

(

of

lb

pl

ba

m

pi

el

te

pa

lin

wi

an

bla

ter

rer

COE

is 1

are

When air temperatures are above 60 degrees, the MC-3 is used without reduction, but between 50 degrees and 60 degrees it is cut back to MC-2½, and below 50 degrees to MC-2½. These reductions are made with No. 2 diesel oil. The asphalt and aggregate are mixed in a Barber-Greene plant, traveling at a rate of 4.75 ft. and mixing 37 cu. ft. of aggregate per minute.

The spray bar in this machine has been moved forward 20 in, from its original position in order to secure the desired effect for this type of work.

Water Resistant Treatment

The Kotal is used to insure adhesion of the asphalt to damp aggregate. This product is a somewhat viscous, mildly acid liquid which combines with lime to form a close and permanently adhesive coating on the stone. The asphalt, in turn, clings to the Kotal-lime compound, and thus the stripping of asphalt from aggregate is avoided. This feature is important because all three windrows on the runway have to be completed before blading out can be started. In rainy weather, which delays the whole operation, one windrow may

be exposed to the weather for 7 to 10 days before it is bladed. As water is essential to the process, any windrow which has dried out completely is dampened before treatment. The water tolerance is large—ranging from 1% to 4% by weight of the aggregate used.

The lime—a 200-mesh quick lime—is applied to the aggregate windrow in the proportion of 11½ lb. to one ton of stone, and is followed immediately by the application of the cutback asphalt to which 2% of Kotal has been added. The whole is thoroughly mixed in the pug mill of the travelling plant, and deposited in windrows.

Proportioning and Mixing

Further details of proportioning and mixing are of interest. The fluid material is prepared in 800-gal. batches, that being the capacity of the tank truck which supplies the mixer. When a straight MC-3 is used, 16 gal, of Kotal are placed in the tank with 784 gal. of asphalt and mixed by the circulating pump during the final stage of heating. For an MC-21/2 product, 16 gal. of Kotal are mixed with 29 gal. of No. 2 diesel oil and added to 755 gal. of MC-3; while to make MC-2 the quantities are 16 gal. Kotal, 58 gal. diesel oil, and 726 gal. of MC-3. Circulation is maintained in the tank during heating. The application rate in all cases is 13.2 gal. per cu. yd. of aggregate (or 10.2 gal. per ton).

Lime is applied by spreading evenly along the apex of the windrow ahead of the machine at the rate of 11½ lb. per ton of aggregate. When applied to the windrow, one 66-2/3-lb. bag of lime covers 11 lin. ft. Good mixing is obtained as the windrow is picked up by the screw feeders of the elevator. Mr. Herbert P. Pearson, technical specialist of the Kotal Company, states that if slacked lime is used the quantity should be increased 50%.

Spreading and Finishing

S

d

15

9-

vs ed

n

Following completion of the travelling plant mix on the three windrows of a runway, the material is spread with motor graders, and bladed back and forth to insure uniformity and an even spread. After two complete bladings of the material of one windrow, approximately 2 in. of the material is moved to one side, and the remainder smoothed out and rolled to secure maximum bond to the tarcoated base. A 10-ton tandem roller is used for this purpose, and 2 passes are required. When this 1-in. layer is finished, and allowed to cure the remaining material is spread upon it



ROADS AND STREETS, October, 1942

and rolled, 4 passes of the roller being given this time. The seal coat is a ½ gal. per sq. yd. application of R.C. asphalt.

Weather through the latter stages of this work has been unfavorable, with low temperatures and frequent rains. It has not, however, interrupted operations except during the actual periods of storms.

Personnel

The Airport Committee in whose hands lies the immediate responsibility for carrying out the work is composed of Messrs. Roy C. Kittleson, Edward G. Sonnenberg, Martin H.



Art Scholl, Engineer in Charge for the McMahon Engineering Co.

Kitz, Edwin W. Raddatz, Lucius W. Clark, and J. F. Shea, Chairman of the County Board.

Plans and all engineering details are the work of A. E. McMahon Engineering Co. of Menasha, Wisconsin, who also supervise construction. Mr. A. W. Scholl, of this company, has been in charge from the beginning, with Ken Sayler as resident engineer. Mr. Herbert P. Pearson, Technical Director of the Kotal Company, is special consultant on the use of Kotal and lime and on the special grades of cutback.

Mr. Pearson made some interesting temperature tests on the windrowed material before and after treatment. Using a 13-in. armored thermometer, he found the same temperature when he bored 9 in. into the windward side of a windrow as when he buried the thermometer at the base of the windrow after it had been dug into with a shovel. Four minutes was required in each case to insure maximum reading. Following are some of his observations:

Fahrenheit Temperatures

Untreated Aggregate . . 53 54 55 56 58 46 48 Asphalt . . . 200 200 205 200 215 215 220 Mix 65 65 68 69 72 63 65

With an aggregate temperature of 46 degrees, it was found necessary to cut the MC-3 down to MC-2½ to secure a satisfactory coating.

Mr. Leon Morrissey, County Patrol Superintendent, is in charge of County equipment. Ross Miller is superintendent of W.P.A.

The Badger Surfacing Co., headed by Burt Hosterman, is contractor for the plant mixing of the surface course.



A king's ransom these days, 3600 pounds of rubber, is carried on this Mack truck, which is used to service big Mack dumpers working on the Panama Canal Third Locks Project. Making tire changeovers is its main job. Shoes for these big truck's weigh over 600 pounds each, or more than 20 times the weight of the average automobile tire

LETTER TO THE EDITOR Rattan Fiber Shortage

Dear Sir:-

Our investigation of the rattan fiber supply situation reveals that an alarming near and long term shortage is impending as foreign import sources of this material are in the hands of the Japs.

From the standpoint of road and street needs, there is a considerable need for split rattan fibers for push-brooms and upright sweepers for snow clearance, debris removal, public airports maintenance, street-car track clearance of snow, and certain types of public roads and streets necessary of maintenance for use by war workers, and many other similar matters vital to public necessity.

The Fibers Section of the War Production Board in Washington, D. C., has the opportunity of making arrangements now for the encouragement of the production of an American split rattan, and providing for a planting program that would make possible future supplies for public and military needs.

May we urge that your publication communicate at once with the Fibers Section of the War Production Board urging that every action possible be taken to avoid a shortage of rattan fibers for the needs of public roads and streets.

> H. F. Root & Son, West Palm Beach, Fla.

What R.P. Meant to W.P.A.

Dear Sir:

I enjoy your page on The Lighter Side of Engineering and Contracting, and also the rest of your magazine.

Skinner Mulvey may be able to use this wheeze.

Several years back, I was setting stakes for a new County Road to be constructed by W.P.A. labor. The center line of the new road followed the section line for several miles making it necessary to set reference stakes for all section corner stones as they would be covered by fill material. All reference stakes were marked with large letters R.P. several days after setting the stakes I returned to see how the work was progressing, and found that all stakes marked R.P. had been destroyed by removal of fill material.

I asked the W.P.A. Foreman why he had taken material from around the stakes marked R.P. He told me that R.P. meant ready to plow so he plowed them out.

> Carl Lemmer, County Surveyor, Great Falls, Mont.

Gemmer steering gears Compact power and endurance





THE Reconnaissance car, or "Jeep" is an amazing accomplishment in power,

endurance and performance.

Gemmer Triple Roller Tooth Steering, too, is an outstanding achievement

in endurance, power and efficiency without excess weight or bulk. Gemmer Gears endure for the life of the vehicle, providing the ultimate in steering control in the heaviest commercial, military, agricultural or industrial installation.

Gemmer Triple Roller Tooth Steering Gears have these all-important factors for desirable steering: EFFICIENCY—Highest available—provides easy steering always—plenty of power for parking. STABILITY—Steering is firm, response positive with absence of rubbery feeling and wander. SAFETY—Abundant safety factor—low internal stresses. DURABILITY—Endurance for the life of the vehicle. CONVENIENCE—Compact design for easy installation and weight saving, without sacrifice of overall capacity or steering arm angularity.

Gemmer Steering is playing an important part in the military vehicle program.



GEMMER MANUFACTURING COMPANY . 8400 Mt. Elliott Ave., Detroit, Mich.



A turnpike section of Forest Service Truck Trail in Nicolet National Forest

gravel, based on plasticity index and other definite factors, the surfaces produced by the simpler methods in the Argonne District are adequate to meet all practical needs, so that, with the limited funds available for construction and the type of use planned for, it is obviously better to build a greater mileage rather than a higher type of surface. This is in accord with the fundamental principle of the Service, that standards and costs of construction shall be adapted to the specific needs of each case.

As has been stated, a large mileage of these roads was built by the C. C. C. Now that that organization is no longer active, the regular summer crews of the Forest Service are carrying on the work-necessarily at a much slower pace. Our 16 men, who it must be remembered are also the initial attack fire crew, are divided into two crews, one on road work and the other on plantation treatment. The road crew of 6 men constructed and gravel-surfaced 2.2 miles between April 1 and July 1 and will finish about 1.8 miles more before Nov. 1st, the end of the season. This crew has two 11/2-cu. yd. dump trucks at its disposal. On jobs of considerable size, gravel is moved by dragline and trapped into the trucks, but on smaller jobs loading is entirely by hand

Corrugated metal culverts from 12-to 30-in. in diameter, provide most of the drainage on our truck trails. End walls of loose stone are installed in most cases and are very effective. We have a number of short span log crib bridges and three single span stone arches, built at sightly points by the C. C. C.

In this gently rolling country we have very little need for cribbing to support the slopes of either fills or

cuts, but it may be noted that in areas of rougher topography, the Forest Service makes extensive use of timber, metal and concrete crib construction.

Although no great refinement of economic calculation is possible where the factors of service value, construction cost and maintenance cost are all as difficult to measure as in the case of truck trails, the Forest Service endeavors to use construction standards which will involve the least net an-



Loading trap at gravel pit on CCC job

nual cost: that is, the total of annual maintenance and annual interest on construction cost should be a minimum. Excessive construction cost will, of course, prevent this, while too cheap construction will have the same effect by requiring excessive maintenance. The construction cost of truck trails in our district ranges roughly from \$600 to \$900 per mile.

Ordinary maintenance of truck trails includes one spring and one fall blading, with intermediate bladings only as required by special conditions. A Galion motor grader is used. Maintenance is carried on by the three tower men during periods when they are not required on tower duty, that is, on days of low fire hazard. One of these men is a trained mechanic and patrol grader operator. The 6-man fire crew also helps with maintenance at times when not engaged in construction of gravelling operations.

The Ranger's read work is inspected by the Forest Engineer, Mr. Paul Zimmerman, who is a staff assistant of the Forest Supervisor. The Engineer advises the Ranger on all road problems, and assists in maintaining proper quality of work and efficiency of performance.

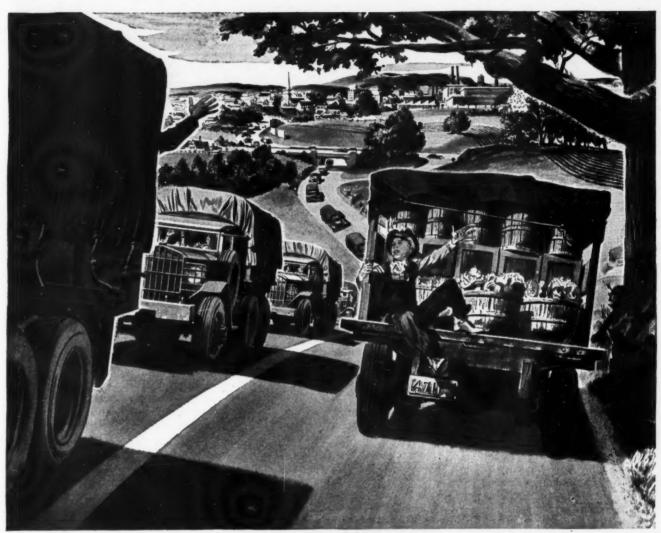
Steel Bridge Design Competition Announced

The American Institute of Steel Construction has announced another annual bridge design competition, open to bona fide registered students of structural engineering and architecture in recognized technical schools of the United States and possessions. and offers three cash prizes of \$200, \$100 and \$50 respectively, for the designs placed first, second and third. Certificates, signed by the Jury of Award and Officers of the Institute, will be awarded to the prize winners and to those whose designs are given honorable mention. The premiated designs will become the property of the Institute.

The subject of the competitive design is a steel grade separation carrying a highway over the 4-track main line of a railway, a navigable canal, and a dual four-lane highway, to which there shall be 1-way connections with the overhead crossing. The structure shall provide a clear width of 42 ft. between curbs. Steel railways are to be provided of a total height above the roadway surface of 3 ft. 2 in. The axial alignment is straight throughout the full length of the structure, and the structure is on a 15-degree skew with the canal, railway and highway, the center lines of which are parallel with each other.

The execution of the design must be entirely the work of one competitor. No other person may work on the design except to criticize and give advice. The drawing must be a line drawing in black ink only. The use of color is prohibited but shadows may be indicated in black ink or a monotone wash. Only one drawing is to be submitted by each student.

A jury of nationally-known engineers and architects will judge the competition on February 17, 1943.



This illustration is taken from a Barrett Tarvia advertisement in The Saturday Evening Post which emphasizes the vital importance of the war-time maintenance programs of America's highway engineers and contractors.

FEEDER ROADS ARE FIGHTER ROADS AS WELL

One of America's most valuable weapons of war is the all-weather highway that links farm to market and village to city, across the length and breadth of our land.

Today, these roads are doing double duty in the cause of victory. For over them, night and day, travels an endless stream of farm trucks from the arsenal of food—and over them, too, move fighting men and fighting materials to a thousand strategic centers of war. They are a vital part of America's 75,000 mile

"Strategic Network" of military access and tactical roads.

It is especially important that these roads be maintained in first class condition for the duration. It's a responsibility of every highway engineer and contractor—a huge problem of maintenance on which Tarvia and the Tarvia field man can help you.

For nearly 40 years Tarvia has been helping highway engineers get the most out of available highway funds. This universal tar paving material is being used with outstanding success to extend the life and service of all types of highways. It has proved the sound economy of "stitch-in-time" road work that saves heavy replacement costs.

Why not discuss your road problems with the Tarvia field man? You'll find him ready with helpful cooperation, based upon Barrett's unmatched experience with road construction, repair and maintenance. Phone, wire or write our nearest office.



THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET, NEW YORK

Chicago . . . Birmingham . . . St. Louis . . Detroit . . Philadelphir Boston . . . Providence . . . Rochester . . Lebanon, Pa. . . . Minnespolt Cleveland . . Columbus . . . Youngstown . . Toledo . . . Syracuse . . . Hartfor Norwood, N.Y. . . . Cincinnati . . Buffalo . . Bethlehem . . . Portland, Me. In Canada: THE BARRETT COMPANY, LTD., Montreal . . Toronto . . Winnipeg . . Vancouver

. . . ONE OF AMERICA'S GREAT BASIC BUSINESSES

ROADS AND STREETS, October, 1942

Editorial

Latin American Development and the All-American Highway

In the second attention is given to non-military matters, little is being said of the Pan-American highway beyond the somewhat wistful comment that "it's too bad it isn't in service as a defense aid and a means of civilian supply during the ship shortage."

On the other hand, the Alaska highway, the northern link in the All-American route, has been much in the public eye-largely because of the spectacular prospect of having it open to trucks in less than a year from its beginning. Our Latin neighbors also are interested in the Alaska road-partly because even the most remote item of hemispheric defense is important to them, and partly through sheer fascination with the thought of a single connecting line extending the full length of the Americas. They are little concerned with its commercial possibilities; and so for the moment, are we.

To the south, construction of the Pan-American Highway has progressed further than many North Americans realize, and it is possible that the route may be fully opened to the Panama Canal before the end of 1943. This will require effort, but it can be done, and the Alaska job is certainly setting a good example. The most difficult terrain to overcome is in the mountains of southern Costa Rica, but there are more or less difficult unfinished stretches in all the countries except El Salvador, the smallest of the Central American republics.

Extensive financial aid from this country will be necessary, and should be unhesitatingly forthcoming for both military and economic reasons. This help is indispensible in connection with major bridge projects and other works requiring large quantities of expensive materials, for the Central American countries have not the necessary wealth, and will not have it within any practical time limit.

Labor in these republics is notoriously cheap, but to expedite construction it will be necessary to introduce machinery in quantity, and there again, help may be required. The early completion of the road

Announcing a New Editor

The Gillette Publishing Company is pleased to announce the addition to the editorial staff of ROADS AND STREETS OF HAROLD J. McKeever, as Associate Editor.

Mr. McKeever is a graduate civil engineer and Associate Member, American Society of Civil Engineers. He was graduated from the civil engineering department of Kansas University and then did post graduate study at the University of Illinois. His engineering experience includes service with a highway and bridge



Harold J. McKeever

contractor, maintenance of way work with the Union Pacific RR and bridge design with the Illinois Central and Rock Island railroads,

McKeever comes to Roads and STREETS from the Portland Cement Association where for the past 8 years he has been Assistant Manager of the Advertising and Publications Bureau. During this time he took a responsible part in the association's extensive publication work, which is known throughout the construction industry for its high technical standards. During this time he has had an opportunity to serve the highway and public works fields as a broad observer as well as a reporter of job methods. A study of express highway development is among his contributions.

Prior to his concrete work, Mr. McKeever served as an editorial writer for several years with the Armco Drainage Products Association and its publication, "The Highway Magazine," where he was the author of many articles on all phases of highway, street and drainage work.

He also spent four years in industrial advertising, serving Bucyrus-Erie Co. and other firms in the earth moving and construction fields.

He is Vice President of the Chicago Federated Advertising Club and a member of the Chicago Industrial Advertisers Association and the Advertising Managers Club of Chicago.

through the republic of Salvador was possible only with our aid.

Beyond the canal the most difficult engineering problem on the entire route lies in the many miles of marshes in the republics of Panama and Colombia. For this barrier is more formidable than any of the spectacular mountain crossings which lie beyond. Various solutions are possible, and careful study will no doubt show which is best. For this work and some of the other existing gaps United States aid will also be necessary.

Road construction in Latin America is by no means confined to the single

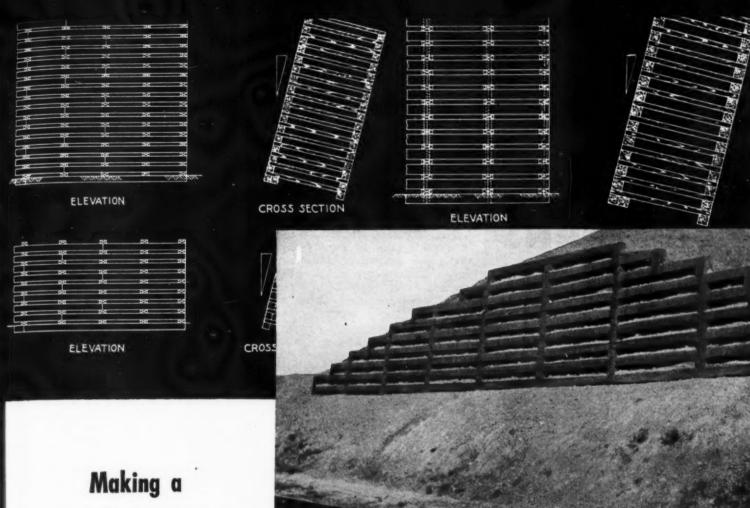
thread of the Pan-American—or as many now prefer to call it—the All-American Highway. Every country has work on branch and intersecting roads in progress or in planning; most countries have both. Also many cities are replacing dirt and gravel and ancient cobble surfaces with concrete or asphalt; and each such improvement stimulates a desire for its like in neighbor and rival communities.

Of major highway projects outside the All-American, by far the largest is the one for a coastal route in Brazil north of Rio de Janeiro. So

(Continued on page 66)

il

th



Making a SHORTER bridge do the job with PRESSURE-CREOSOTED CRIBBING

Short-cuts and savings take on extra importance today . . . and pressure-creosoted cribbing helped to make them here.

Flattening the head-of-bank to a safe angle of repose would have meant moving hundreds of cubic yards of material . . . and demanded a considerable increase in bridge span. A low-cost retaining wall of pressure-creosoted cribbing made all this unnecessary.

Many railroads and highway departments are utilizing this safe, simple, economical and permanent method of reducing labor and material requirements in constructing overpasses, preventing encroachment of embankments on adjoining property, holding toe of fill along highways, and similar jobs.

Pressure-creosoted cribbing can be framed to your specification, prior to

pressure-creosoting. Assembly can be handled with local labor, and minimum equipment. Sectional construction can be used, with excavated material (where suitable) utilized for backfill. The completed structure is ready for use immediately; no shoring or back-work to be removed. Should future changes become necessary, material can be salvaged. Pressure-creosoting gives dependable protection against decay and termite attack.

On your retaining wall jobs . . . it is profitable to check up on what pressure-creosoted cribbing can do.

WOOD PRESERVING DIVISION KOPPERS COMPANY

PITTSBURGH · PENNSYLVANIA

use K O P P E R S

products

Whenever Darkness Strikes! DIETZ LANTERNS



When uninterrupted light over long periods may be required, at the moments needed, there is nothing to equal an ever-dependable DIETZ LANTERN

For blackouts set wick at lowest point for positive flame. DIETZ WHITE and RED GLOBE LANTERNS, with flame turned low, are less visible from the sky than any other colors.





ROAD TORCHES



Editorial

(Continued from page 64)

far as we are aware this is at present merely in the discussion stage, but there is ample reason to anticipate its early advancement toward actual construction.

Another important project in Brazil is the one for a jungle road from Manaos, far up the Amazon River, to Georgetown in British Guiana. Its accomplishment would, of course, require the cooperation of the British, but the governments of both countries are reported to be considering it favorably. Such a road would speed the shipment of raw rubber and other strategic materials to the United States.

The economic development of South America is now entering a speed-up stage in which, taking the continent as a whole, the changes of the next twenty years will probably exceed all the rest since Columbus. Trade with the United States will be on a scale not known before. In fact, in all history there has never been an opportunity for mutual benefit between continents like that now pending between North and South America. Military reasons, economic reasons, and the higher political reasons call for the early completion of the All-American Highway and for such contribution from the United States as may be necessary to that end.

Our New Equipment Maintenance Section

WITH this issue, Roads and Streets inaugurates a special section

devoted to the maintenance of highway equipment. In the past we have carried—numerous articles on this subject—sometimes several in a single issue—but the present period, in which it is vital that every machine be made to yield its last possible unit of useful service, demands more inclusive and also more concentrated attention.

If we will look back frankly—engineers, contractors, superintendents and, yes, editors—we must admit we have been extravagant. We were busy; it was easier to buy a new machine than to fuss with an old one; therefore, when faced with extensive maintenance, we too often sent the old unit or the old part to the junk pile, with no very careful consideration to the possibility that repair might be more economical than replacement.

Similarly there has been too little regard for proper upkeep and care in operation. Certainly a dump truck or a bulldozer is not made to be babied: it must hit the grade and hit it hard, and if the truck or the bulldozer can't take it, we better get something else. But that is no reason why we should neglect systematic oiling, bolt tightening, and the other items of upkeep which are clearly presented in every manufacturer's maintenance manual. For these manuals have been prepared by capable engineers whose primary concern is that their machines shall render the most satisfactory (the most truly economic) service. Subject, as in all things to human fallibility, their advice is sound. Follow the manuals and save money!

CORONACH

"Of those immortal dead who live again In minds made better by

In minds made better by their presence."

Frank E. Blanchard, sales engineer of the Caterpillar Tractor Co. since 1935, September 14, 1942. Mr. Blanchard's home was at 208 Callender Ave., Peoria, Ill. His business connections prior to the time he joined the Caterpillar organization included the Milburn Wagon Co., Buda Manufacturing Co. and the Climax Engineering Co. During the years of these associations he had made many friends in Illinois, Ohio and elsewhere. His outside interests were varied, including music, stamp col-

lecting, church work and fraternal

GEN. THOMAS H. REES, retired, September 20, 1942. Gen. Rees died at the Walter Reed Hospital, his residence for many years having been in Washington. He was a graduate of the Engineering School of Application and the Army War College. In military service he had taught civil engineering at West Point; served with the engineer corps in Cuba during the war with Spain, emerging as battalion commander: was in charge of fortifications and river and harbor improvements in Florida, was on duty at the Army Staff College at Leavenworth: and was colonel, and later brigadier general, during World War I. He also was engineer on river

(Continued on page 99)

Care and Repair in Shop and Field

CONSERVATION ROAD

SONSTRUCTION SOUTH AND SECTION OF ROADS & STREETS

MACMILLAN PIONEERS AGAIN!



HERE IT IS! The quart container for motor oil which motorists and dealers have been expecting!

And it's Macmillan who pioneers again! A "can" without metal for RING-FREE!

With the steel mills converted to war purposes, the supply of metal cans for oil has dwindled and virtually disappeared. That was natural and right.

But motorists, wanting to be sure of getting RING-FREE—in its own quickly identified quart containers—have been hoping that this difficult packaging problem would be solved.

Now the new quart is ready! Now every independent dealer selling RING-FREE can open this new container and put in the fill of RING-FREE every car has been thirsting to get!

Among other things, Macmillan pioneered with RING-FREE motor oil ten years ago. There never has been an oil like it. There can't be, because it's refined by an exclusive, patented process.

That's why it removes carbon, saves as high as 10 per cent on gas, reduces friction fast, saves wear and repairs and lengthens the life of your car.

Now Macmillan pioneers again—after months of

search and research bringing out a metalless container to assure motorists of getting RING-FREE!

The Macmillan sign is shown at independent filling stations, garages, and car dealers. Drive in and get your fill of RING-FREE today! MACMILLAN RING-FREE MOTOR DIL

MACMILLAN PETROLEUM CORPORATION

50 West 50th Street, New York 624 South Michigan Avenue, Chicago • 530 W. 6th Street, Los Angeles

Copyright 1942 by Macmillan Petroleum Corp. 35C

Construction Equipment Maintenance

This section has been organized to meet the present emergency, in which more than ordinary service must be obtained from tools and machines. In it will be presented useful information on the care and repair of road equipment, and also on the improvization or outright manufacture of items which cannot now be purchased. Descriptions of shops and the tools with which such work is done will form a logical feature.

When the emergency has passed, the section presumably will be continued, but with this difference: there will be very few articles on the "home manufacture" of machines or parts. For ingenious and creditable as is the work of this sort now being done in all parts of the country, it cannot compete with factory production and will not be justifiable when normal sources of supply are again open.

The editors ask their readers' help

in making this section of maximum value to equipment users. If you have developed or observed a successful kink or an ingenious plan, other construction and maintenance men will welcome an account of it. If in doubt about its novelty, don't let that deter you; for if you're in doubt the idea probably isn't widely known. More inexperienced men are building and maintaining roads today than ever before

CONTENTS OF THE SECTION

Dane County, Wisconsin, Meets War Emergencies in Machines and Parts70-72
Repair of Track Rail and Other Tractor Parts by Electric Welding
Repairs in Shop and Field by Electric Arc Welding .73-77
Repairing Fractured Bulldozer Blade
Building Up Worn Dipper Teeth
Welding New Feet on Tampers
Shovel Bucket Repaired by Arc Welding
Repairing Extension Hitch of Dragline Bucket
Lengthening Dipper Teeth
Welding Makes Possible Use of Scraper Blades on Both Edges
Bucket Latch Repairs
Repairing Shovel Bucket Teeth
Repairing Load Clevis and Pin
Save Illustrations of What Has and What Can Be Done by Arc Welding
Maintenance Garages "Keep 'em Running in Spite of Many Handicaps
Weld Rollers Carefully and Avoid Machining 80

	- 1
Broken Shaft on Shovel Repaired by Arc Welding	81
Reclaiming Shovel Track Pads	81
Repairing Break in Side of Dump Buggy	81
Repairing Wheel	82
A Rubber Guide Book for War Industries	82
Repairing Dumping Gate	82
Trench Hoe Attachment Made with Salvaged Material	82
How to Lubricate a Motor in 2 Minutes	83
Worn "Crowfoot" Reclaimed by Welding:	83
Life of Conveyor Belt Increased by Program of Inspec- tion and Maintenance.	83
Repairing Grousers of Tractor Treads	84
Clean Welding Machines	84
Preventive Maintenance for Bituminous Distributors	84
Repairing Steering Spindle	84



The Dane County, Wisconsin, Highway Department is served by one of the largest and most modern maintenance—shop and garage buildings in the middlewest. And by an organization that's geared to war conditions! Odin Hanson is County Commissioner

Dane County, Wisconsin, Meets War Emergencies in Machines and Parts

IF EVERY county and state highway maintenance department in America had a shop crew like George Bouin and his boys in the Dane County garage at Madison, Wisconsin, folks could breathe easier about the fate of the country's roads in wartime. They'll be maintained, spare parts or no spare parts for the graders and tractors.

In his job as shop superintendent, Bouin has to keep 55 trucks rolling, along with 11 motor graders, 30 road maintainers, 57 snow plow units of all types, 9 tractors, a power shovel and miscellaneous other equipment — 760 individual wheels to keep repaired and supplied with ready replacement parts that today are often unobtainable.

For this task Bouin has one of the finest highway garages in the middlewest, housed in a modern 400 by 80 ft. building of fireproof construction. But he has more than that. He and his men have shown ingenuity, sound knowledge of machine shop practice, and—most important of all—a deadly serious wartime "make it do" point of view.

"We can build just about anything," is the war slogan of Dane County's maintenance men. As proof, following is a partial list of accomplishments since Pearl Harbor—"war baby" parts built out of junk, repair jobs done on worn out units that once would have been scrapped, and complete pieces of



Another example of wartime emergency repairs—"a worn out" hydraulic control pump unit for tar distributor, fixed with new bearings and a new drive shaft turned on the shop lathe

shop or field equipment built from materials at hand.

"War Baby" Parts

The following are typical of the numerous home-made parts turned out to fill replacement needs:

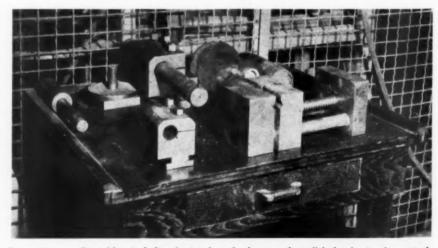
Spacer plate, between dual rear truck wheels—made from scrap.

Front axle ball, for bituminous retread paver—made on lathe from high tensile stock.

Snow plow pin—another lathe job from scrap.

Draw bar pin—from piece of broken axle shaft.

Grader cross bar-turned from stock metal.



Every piece on this table—including boring bars for large and small lathe, boring bar attachment, lathe center tool, drill press vise, pipe centers and lathe center—was made in the shop

Snow plow shoe adjuster bolt—from hard steel stock.

Cable adjuster bolt for a Continental scraper—a small part, but took several shop machines and some thinking.

Grader tie-rod bolt—this one was easy.

Adjuster bolt for Wausau snow plow—turned from scrap, threaded, eye hand forged; good as factory part.

Salvage and Repair Jobs

And among Dane County's recent fixin' jobs of the type you didn't used to see are:

Small hydraulic pump control unit on tar distributor—restored with new babbit bearings and new shaft, latter made on shop lathe.



More "war babies" made or assembled from scrap in the Dane County shop to keep the store stock room shelves replenished. Most of these items are listed in the accompanying article

Shackle bolt for rear truck spring—from cold rolled steel stock.

Ram extension for snow plow.

Tractor draw-bar pin.

Clutch adjusting wrench for HD 10 Diesel tractor—nice job.

Large special bolt for door of Continental scraper.

Bronze bushings—many of these are made from stock metal.

Shift lever on motor grader—worn end built up by arc-welding with hard steel welding rod; end squared to shape.

Center-line marker paint pump-rebushed and worn parts rebuilt.

Reinforcing bar cutting shears—broken casting of intricate design replaced by machining a new part from junk-yard scrap; the boys are proud of this one.



George Bouin, shop "super"

Also several pieces of needed equipment were rigged up:

Snow plow rams were made from "pieces found around the place."

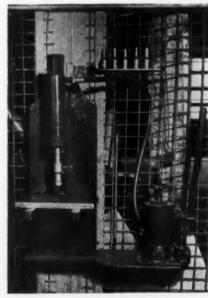
Double two-way ram for shop use in straightening bodies and fenders, etc., was built—also from junk.

Special lifting jack of clever design, with an arm for reaching into truck cabs and over engine blocks to lift out transmissions or cylinder heads, was built 100% in the shop, excepting for a standard hydraulic jack unit incorporated. Lengths of old pipe served for the frame. Even the casters are home-made.

Even the casters are home-made.

Truck wheel jack of special design for shop use, made from old pipe, shafting and other scrap; only the casters are factory made.

Numerous machine shop units have been built, including boring bars for small and large lathe, boring bar attach-



Yesterday, junk and cast-off parts! Today, a complete hydraulic shop press. Read how this prize "war baby" was put together



This gravel conveyor has a Ford 4-cylinder motor, propellor shafts from two Model T Fords.

The rest too, is strictly amateur

ment, lathe center tool, drill press vise, large and small pipe centers, and lathe center.

Three full-fledged belt conveyors were "cribbed from here and there" using discarded materials. For example, one has a Model A Ford engine, shafting from two Model T Fords placed end to end, axle and spring and wheels from a small truck, and framing made from odd structural pieces.

Perhaps the prize exhibit is a complete hydraulic shop press, built out of scrap or discarded parts. This useful assembly (try and purchase anything like it today!) includes a cylinder made from old bridge rail pipe; plunger made from an old axle shaft; hydraulic pump unit restored from a snow plow; welded base bracket made from scrap; and wall frame support consisting of pieces of angle and strap from an old bridge.

The County's Shop Equipment

Most of these accomplishments of course would have been impossible without good shop equipment. In some cases jobs have had to be sent out to a local machine shop, such as the case recently when a new splined

When a casting on this bar cutter broke (see arrow), a new one was machined from junk steel

sleeve was made and pressed into the rear wheel of a motor grader.

The Dane County shop is outfitted with three lathes, large, medium and small, the largest having a 10 ft. bed; a large heavy-duty and a small drill



The long arm of this lifting jack contraption—made from odds and ends—is handy for lifting heavy transmissions out of cabs, snatching cylinder heads, etc.

press; shaper; heavy-duty and small grinder and large emery grinder; valve refacing machine; bushing reamer; brake drum lathe; hydraulic press; complete electrical testing bench; blacksmith trip hammer; electric welder; large forge; machine saw; brake relining machine; acetylene welder; woodworking bench including circular saw and planer; 12-ton hydraulic lifting hoist for servicing trucks; and small and overhead cranes.

Cooperation in Scrap Drive

Needless to say the County has turned in its share of scrap metal and rubber. But it is also mindful of the obligation to continue maintaining its roads. Junk tires are often given several extra months of usefulness on old maintainers and other secondary equipment before selling as scrap. Recapping is done systematically; a policy for several years. The county sells scrap metal, but it also buys it. Many a machine is rolling today because a supply of old shafting and other junk yard materials is piled in the corner of the shop for use in making parts.

Meanwhile every effort is being made to stretch the service life of all machines by following simple precautions. Truck speeds are watched, of course, and more frequent inspection is required. Whenever a patrolman comes in with a broken part, it is made certain that he knows why it is broken and how to prevent future breakage or excessive wear before a new part is issued. It is the belief of the County Road Commissioner, Odin Hanson, that the morale of the thirtyone men out on patrol sections, as much as shop ingenuity, will determine how well the county's equipment weathers the emergency.

Repair of Track Rail and Other Tractor Parts by Electric Welding

A repair job which seems to be yielding a substantial economy is reported by Mr. C. L. Foley, Highway Commissioner of Oconto County Wisconsin, Says Mr. Foley:

"One of the interesting repair jobs completed recently was a track repair job on a 30 H. P. Tractor. The track rail was badly worn and the pins and bushings were in bad condition. It was first decided to purchase a complete new set of tracks at a cost of \$621.89. About that time, the war regulations came out advising to make repairs wherever possible to conserve critical materials. so we then decided to make it a shop job. The tractor was entirely dismantled and all worn parts rebuilt by electric welding, and machined as follows: Rebuilt teeth in final drive gear, drive sprocket and final drive pinion. Rebuilt final drive hub, front idler, carrier rollers, track links, front idler bearings and track rollers. Made new front idler shaft and new carrier roller bushings. Refaced master clutch plate and rebushed steering clutch control assembly. The total cost of this job was \$358.40 and the tractor has been working the past few months with good results. A recent inspection shows that the built up parts are in good condition. We do not know whether a job of this kind would be satisfactory on our large tractors, but intend to try it when necessary."



REPAIRS IN SHOP AND FIELD BY ELECTRIC ARC WELDING

Repairing Fractured Bulldozer Scraper Blade

Bulldozer scraper blade, fractured in service, was repaired with Lincoln "Fleetweld" as shown. Note the reinforcing bars which are welded crosswise to stiffen the section so as to provide greater strength than the original construction.



Bulldozer scraper blade repaired by welding

Building Up Worn Dipper Teeth

For welding repairs on worn dipper teeth (Fig. 1), which usually are manganese steel, uniform pre-heating to 500°F. is advisable. For building-up, a mild steel electrode, like P&H "AP," is used. Built-up teeth are then hard-surfaced, "Harcote," a self-hardening electrode, often being used.

The same procedure applies when building-up teeth with manganese steel inserts. (Fig. 2) "AP" electrode can be used for making the union and "Harcote" for hard-surfacing. While desirable, pre-heating is not absolutely necessary on manganese, if hard-surfacing is not to exceed 1/4-in. depth. When pre-heating cannot be done, the insert should be

built-up and surfaced P&H "AW-3" electrode, often being used for this purpose. However, if manganese inserts are not available, the shape can be cut from 40 carbon steel, preheated to 500°F., filled with "AP" metal, and given a heavy surfacing of "Harcote."

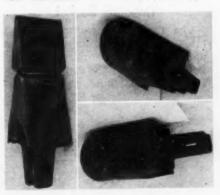
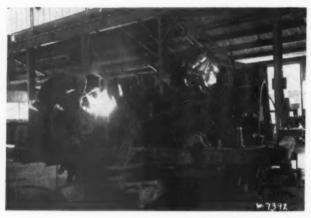


Fig. I Fig.

Welding New Feet on Tampers





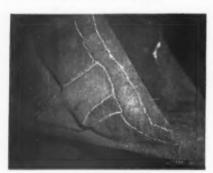
New feet being welded on sheepsfoot tamper

On this particular job the tamper drums were 58 in, in diameter and 5 ft. long. There were 108 teeth in each drum. The feet were steel castings. The old teeth were cut off with oxy-acetylene flame and the surface was smoothed off with a chipping hammer. The new feet were welded

on with two passes of 3/16-in. "Fleetweld 5." The caps shown are wedged in and are replaceable.

Shovel Bucket Repaired by Arc Welding

The worn edge was built up with "Manganweld" electrode. A weakened section was stiffened by welding on a plate, and sections subject to wear were built up with "Manganweld." The opposite side of the bucket was worn and repaired in the same manner. Similar repairs were made in the back part of the bucket.



Repaired side of shovel bucket

Repairing Extension Hitch of Dragline Bucket

The illustration shows extension hitch cleats for dragline bucket. The part on the left is worn, ready for repair. The one on the right has been repaired by building up and hard-



Worn and repaired extension hitch cleats

facing. Time required approximately four hours with a repair cost of about \$6.00. Replacement cost of this part is \$10.75.

Lengthening Dipper Teeth

When you've got to meet special digging conditions such as loosening

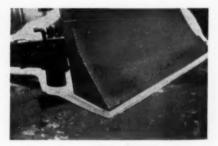


Welding 5-in. extension to dipper teeth

tough rock, try this solution which turned the trick for one road contractor in a big way. Five-inch extensions were added to the original length of teeth on the excavator dipper shown. The extensions were cut of 1040 steel, beveled, and buttwelded to the teeth. Stringer passes were used, with each pass cleaned and peened. To make sure of a strong weld of the original teeth and the extensions, which were of different analyses, the welder used "Harstain 25-20," a P&H stainless steel electrode which is very tough. Then to protect the new teeth against wear. their points were hard-surfaced with P&H "Harcote" applied in stringer passes for 2 in, along the bottom and 1 in. on top.

Welding Makes Possible Use of Scraper Blades on Both Edges

With the help of arc welding, scraper blades can be used on both edges. It is an easy job to turn the blades. But since the skid shoes are also worn, they will not fit the unused edge of the turned blade. Any welding operator, however, finds it easy to build up the leading edges of both skid shoes with hard facing electrodes. Job shown above is typical. Note amount of wear from finished weld beads on skid shoes. Job was performed by Norman J. Fitzer, welding operator, for the City of Miami, Fla.



Scraper blade welding job at Miami, Fla.

Bucket Latch Repairs

Various parts of earth-moving machinery frequently show more wear than others. On excavator dippers, for example, such parts are bucket latch, ribs, back, etc. Usually they are made of high tensile steels and therefore, in making welding repairs on these parts, alloy electrodes containing the basic alloying elements of the parent metal should be used.



Repairing bucket latch by welding

ged

of

ges

ing,

oth

the are used eld-

easy

ooth

elec-

ical.

shed

was

eld-

ami.

ma-

wear

pers,

ucket

they

and

pairs

con-

nents

used.

In the bucket latch repair job illustrated, the operator is using P&H "Harten A" electrodes. To determine if a part is manganese steel, apply a magnet. If manganese, its magnetic pull will be inverse to the amount of manganese content.

Repairing Load Clevis and Pin

The illustration shows a worn and a reclaimed load clevis and pin for dragline bucket. On the left are shown these parts worn. On the right they have been reclaimed by building up the worn parts and hardfacing. The clevis costs about \$3.50 new and is repaired in about one hour's time at a cost of approximately \$1.50. The pin costs approximately \$1.50 new and is repaired in ½ hour's time at a cost of approximately 75c.



Worn and reclaimed load clevis and pin

Repairing Shovel Bucket Teeth

The procedure employed by this contractor is to weld on special replacement tips with "Manganweld" electrode. The manganese steel tip is then hardfaced with "Abrasoweld" along the sides and at the point. Often it is also hardfaced around the edge of the hole by which the tooth is attached to the shovel bucket. At the left is shown a tooth previously



Reclaiming worn teeth

reclaimed by this method which has been worn down and is now being reclaimed again. The refaced manganese steel tip is shown in the center. A repaired tooth is shown at the right. On teeth of this size costing \$7.00 for replacement, total cost of repair is approximately \$3.75, including one hour labor plus materials. The manganese cap costs about \$1.75 which is included in the total repair cost of \$3.75.

(Continued on page 81)

INCREASE THE LIFE of YOUR CURING MATS

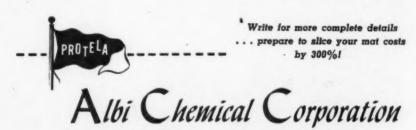


Conservation is the key note for the duration! Constant weathering of these quilts quickly promotes mold and mildew deterioration, resulting in unnecessary repeated replacements.

PROTELA, mildewproofing compound, is durable, economical, non-poisonous and non-inflammable. You can apply it as readily as water to fabricated mats, even while they are in service.

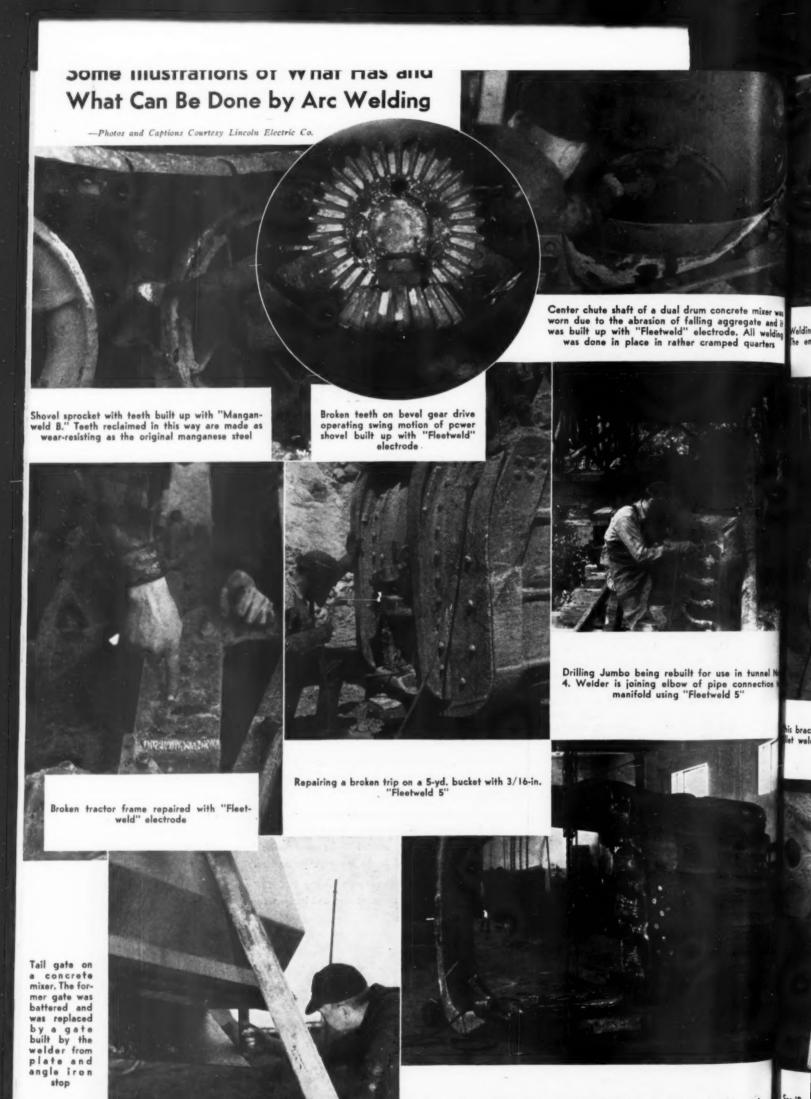
PROTELA has passed extremely stringent tests... proving its effectiveness under all conditions of heat, sunlight, and humidity, including those of the tropics. Sixty-four million yards of critical Government fabric have been mold- and mildew-treated with PROTELA in the last eighteen months.

To cut down your replacements, specify PROTELA-proofed quilts with your new order from the mill or manufacturer, and insure longer and more satisfactory service.

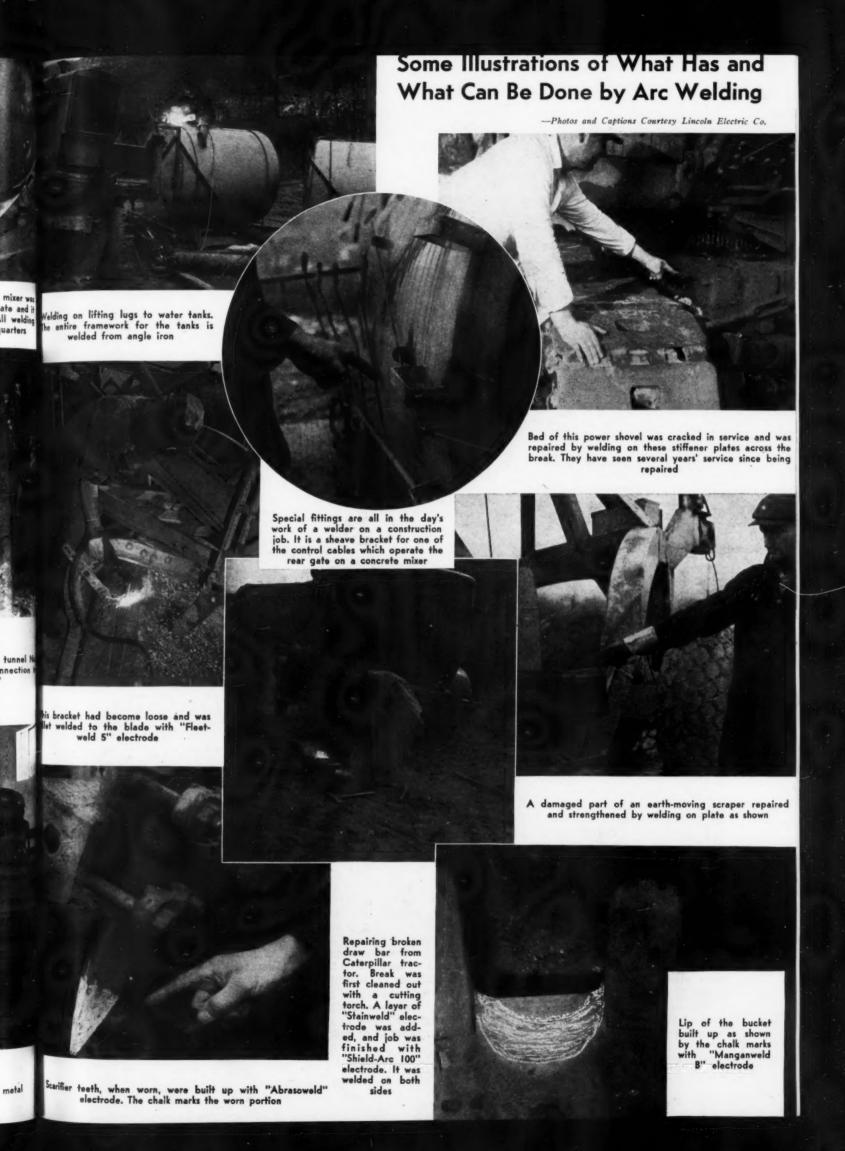


9 PARK PLACE, NEW YORK

ROADS AND STREETS, October, 1942



Lip of dragline bucket overlaid with manganese steel weld metal





A view of the east end of the garage, showing the P-H Smootharc welder; the Manley automotive press; the Wolcott floor lathe; the drill press; Marvel draw cut saw and the gas and air cylinder hand truck. Note the lift on the overhead rail which runs the length of the shop

Maintenance Garages "Keep 'em Running" in Spite of Many Handicaps

Pages have assumed vastly more importance in state, county and municipal road and street department organizations since war time restrictions on new construction equipment and the tight regulations on replacement parts have been in effect.

Mechanics of the garage staffs are tickled with the opportunity to "dotheir stuff," and are to be credited with many important accomplishments in the present time of stress.

The equipment maintenance garage of District No. 13, Illinois Department of Public Works and Build-

ings, Division of Highways affords some excellent examples. Located on State Route No. 25 on the outskirts of Elgin, Illinois, it is accounted one of the best equipped and expertly staffed of the maintenance garages in the 10 districts of the State.

The garage occupies practically all of the ground floor of a three-story brick building, 250 ft. long and 45 ft. wide, originally a shoe factory but now occupied by the State as District No. 1 headquarters for several State department units, including, on the second floor the spacious offices of the State Highway Police.

In addition to repairing and main-

taining the wide variety and great number of construction and maintenance units of the highway division, the garage services the mobile equipment of the Department of Conservation, the State Highway Police, the Department of Finance and the Department of Public Welfare in District No. 1. The accompanying diagram gives the layout of the part of the building occupied by the garage.

Truck and engine overhauling account for a large item of shop time. but the repair and maintenance of other highway equipment comes in for a good share of attention because of the unusually large and varied equipment inventory. Within the District's limits are many miles of secondary roads, several four-lane highways and many miles of access roads, for it embraces a large industrial section, most of the plants being engaged in important war work.

To the north of the building is a large fenced-in equipment storage yard, with an eye-catching scrap pile in its furthest corner. It is a salvage pile rather than a scrap pile for from it have been salvaged junked materials that have been successfully used in building parts, and indeed entire units, for which no replacement parts could be secured.

A "New" Power Winch Truck

There is, for instance, the building of a power winch truck, with parts salvaged from the scrap pile. This is only one of several jobs, descriptions of which we hope to have available for publication in this department in

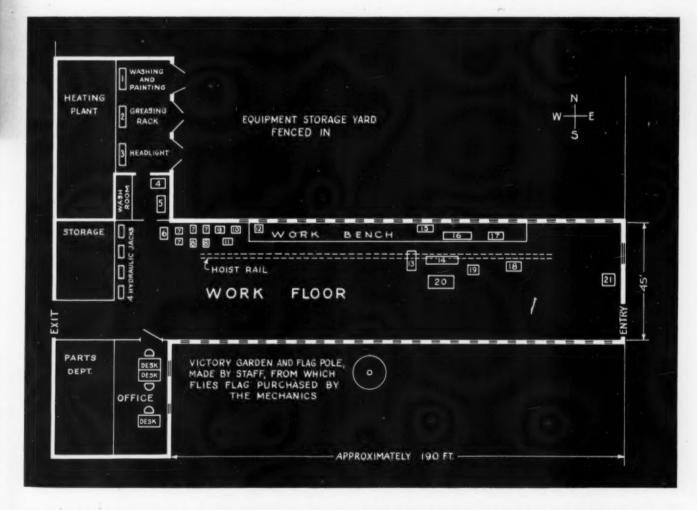


When acquired by the Department, the space now occupied by the garage was dark and dirty, as indicated by the above picture, which was taken before the staff cleaned up the mess and painted the walls and ceiling white

future issues, but it distinctly typifies the ingenuity and expertness of the members of the staff of mechanics.

The winch building project started with the chassis of an International truck that had been badly damaged in an accident. As the floor boards were so badly warped that a new floor would have to be made, a wire mesh was stretched over them and then asbestos cement was put on to make a smooth, level surface. The floor boards from an old Ford truck, long discarded, were laid on top and spiked down. When the asbestos cement set the spikes were firmly and securely imbedded and the floor was perfectly smooth and level.

The base of the winch was made from a part taken from the front end of an old snow plow, long relegated to the scrap pile. The reel was made of scrap pipe and scrap steel. The superstructure, boom and arm, were made of 4 inch scrap pipe. The winch is operated from a power take-off, with transmission from an old Willys car, with clutch control, throttle control and speed control. A strong steel strap attached to the floor frame on either side runs down to the chassis frame, so that strain is on chassis frame. A spotlight,



Layout of the garage: I—Hayes car washing unit; 2—Turco radiator flushing unit; 3—Weaver headlight aligning unit; 4—Binks paint spraying unit; 5—Quincy compressor; 6—Power pressure unit; 7—Four Alemite greasing units; 8—Two Service Station greasing units; 9—Jordan battery charger; 10—Weindenhoff cyclonic unit; 11—Sun combustion tester; 12—A-C spark plug tester; 13—Manley automotive press; 14—Walcott floor lathe; 15—Stevens connecting rod aligning gauge; 16—Atles bench lathe; 17—Sunnen grinder and buffer; 18—drill press; 19—Marvel draw cut saw; 20—H-P Smootharc Welding unit; 21—forge



View of work floor and bench, along north side wall. The shop is divided by pillars into ten bays, each 10 ft. wide and approximately 30 ft. long. Ten large size trucks can be accommodated at one time. Exceptional lighting is afforded by the 24 windows on the south, and 20 windows on the north side walls

taken from a smashed-up police car, is mounted on a swivel base atop the truck cab.

The construction of this unit was accomplished without the outlay of a penny for parts, and represents a striking salvage project. No track was kept of the labor-hours as the work was done on idle time and practically every mechanic had a hand in the job. For an equipment maintenance garage with the responsibility of the care and repair of mobile equipment units, a power winch truck is almost a "must" unit.

The District No. 1 garage at Elgin is staffed with 12 mechanics and two clerks, under the charge of Superintendent R. H. Kluender. Mr. John T. Wachtman, smithy and mechanic, has had more than 20 years experience in the care and repair of construction equipment, and before joining the State staff was the mechanic for Chas. E. Giertz & Sons, construction contractors at Elgin.

Emergency Production of U-Bolts

The bridge engineer recently sent in an order for several hundred Ubolts, used in bridge wrok. It was impossible to obtain them on the market. Making U-bolts would seem a simple job but it really requires expert smithy skill to make them by hand, and Mr. Wachtman realized that it would take a month to turn them out by that method. As the bridge crew needed them at once, he made a simple device, from salvaged scrap, which he fitted on the end of a Manley automotive press and turned out the order of U-bolts in a short time. We hope to give a description, with illustrations and details of Mr. Wachtman's device in an early issue.

The garage is well equipped with both hand and machine tools, and in addition has a wide line of garage equipment units.

Superintendent R. H. Kluender and his staff take justifiable pride in

their shop, the efficient system of operation, the out-of-the-ordinary jobs they have turned out and the use they have made of salvage material when replacement parts were unobtainable. Some of these interesting projects will be described in future issues.

Tip: Weld Rollers Carefully and Avoid Machining

From shop superintendent Reuben Kuntz of the Dodge County highway department at Juneau, Wisconsin, comes the suggestion that tractor rollers won't need machining if arc welding to build up worn surfaces is done carefully enough. Anyone who has tried to machine down electric welds knows it is a tough job. "Just take a little extra care in building up the metal, then put them on and let them pound themselves true," said Kuntz, who learned this trick while serving as master mechanic recently at the Eau Claire Ordnance Works.

Broken Shaft on Shovel Repaired by Arc Welding

Figure 1 shows shaft on a small diesel shovel broken about 4½ in. from its one end. This shaft carries



Fig.



Fig. 2

the swing and travel pinion for the shovel. Although a new one could have been delivered in a week, the shovel was needed for work immedi-

ately. For repair, the broken shaft was fitted back into place and tack welded. Then deep "V's" were cut into crack with an acetylene torch. Build up beads were run with 1/8-in. mild steel rod. After shaft was welded securely together, of course, the tack welds were "V'ed" out also. Shaft was turned during welding to keep welds even and to facilitate safe cooling. Very little grinding was needed on the welds. Figure 2 shows completed repair. Complete repair job for the Lakeside Gravel Co. of Bellvue, Wash., cost only \$12.45. A new shaft costs \$70.

Reclaiming Shovel Track Pads

A large number of these pads were reclaimed by arc welding. It was al-



Reclaimed track pads

most a continuous production job. The two shown are part of a large pile which were to be repaired. Replacement cost of these pads was \$39 each. They were repaired in an average of about two hours each using about 4 pounds of "Hardweld" electrode with a total repair cost of approximately \$3.

Repairing Break in Side of Dump Buggy

The illustration is an interior view of a typical break in the side of a dump buggy interior. Such breaks have been welded with several passes of "Fleetweld" 5-in. electrode. In some cases steel plate is welded over the break to give additional resistance to abrasion and impact.



Break in side of dump buggy

SCRAP IS VITAL to the WAR EFFORT

Millions of tons of scrap steel are wanted for making steel for ships, tanks, trucks and guns. The demand is far in excess of that being salvaged now and unless new supplies are quickly obtained war production is bound to sag.

In behalf of the National War Effort and America's steel producing companies we urge your fullest cooperation in salvaging every available pound of scrap—not only the usual shop waste but all obsolete or discarded steel about the place.

Sell it through the nearest junk dealer or inquire of your local War Salvage Committee. Practice turning in your scrap metal frequently—as long as the war lasts.

I



ALLOY STEEL & METALS CO.

1862 E. 55TH ST. LAfayette 0181 LOS ANGELES, CALIF.

Mfrs. of PACIFIC CRUSHING & SCREENING UNITS • PACIFIC SLUSHING SCRAPERS & SHEAVE BLOCKS • Alloy-Manganese Steel CRUSHER JAWS, MILL LINERS and TRACTOR RIMS • PACIFIC Rock Bit GRINDERS • CRAWLER SHOES and Steel Wearing Parts

Repairing Wheel

The wheel shown in the illustration broke in service at the junction of each spoke to the rim. It was repaired with 3/16-in. "Stainweld." Seven pounds of electrode were used and actual welding time was six hours. The wheel new costs in the neighborhood of \$100.



Wheel repaired by welding

A Rubber Guide Book for War Industries

Designed to present maximum information in easily accessible, indexed, condensed form, The B. F. Goodrich Company has just published a 30-page rubber guide book for American war industries, listing the application and properties of many types of products for industrial and aeronautical purposes using natural, synthetic or reclaimed rubber. The booklet will be mailed upon request, from the company's principal offices in Akron, Ohio. Well illustrated throughout, the booklet is divided into 11 indexed sections. One of the most pertinent chapters in the synthetic rubber section is that devoted to the properties of Ameripol compounds used in handling aromatic, Asiatic or loaded fuels. Other features include the listing of principal molded goods, and a review of sponge, lathe cut and hard rubber processes using either natural, synthetic or reclaimed rubber.

Very few new tractors are available. The work necessary to win this War must be done primarily through tractors that are already in the hands of farmers, contractors, logging operators, coal strippers, highway departments, oil field operators,-the tractors that are today, already performing the thousands of tasks which keep food, oil and lumber flowing, and keep the highways and railroads in condition for transporting the same .-Cletrac Facts.

Repairing Dumping Gate

Dumping gate underneath was damaged in service. Here, the crack was welded with "Fleetweld" and a stiffening angle was added as shown. Entire surface of the buggy, worn from impact and abrasion, is repaired by welding on plates over the battered and broken parts



Dumping gate repaired by welding

Trenchhoe Attachment Made with Salvaged Material

By FRANK T. ADAMS City Manager, Belfast, Maine

The illustration shows a trenchhoe attachment, which we built and installed on a half-yard shovel. To date (Sept. 14) this attachment has had over 600 hours' service with only minor repairs.

The materials used in this attachment were of junk or second-hand parts salvaged from worn-out equipment, with the exception of the

sheaves and the boom. The bill of material is as follows:

-10-ft. I-Beams, 4-in. webb (mast) -14-ft. I-Beams, 7-in. webb (boom) -7-ft. I-Beams, 6-in. webb (dipperstick)

-10-in. Sheaves, bronze bushed -cast boom hinges (from discarded

Speeder boom)
½-yd. Bay City bucket
2-in. x 6-ft. galvanized iron pipe -½-yd. Bay Ci -2-in. x 6-ft mast braces)

The 7-in. I-Beams were electrically welded together and a continuous plate welded on the flanges, top and bottom. An opening 2 ft. long was left at the center of the boom for the installation of two sheaves over and under which the in-haul line passed. The boom hinges were welded on the lower end of the boom and the boom was pierced with a hole large enough to take a 2-in. inside diameter pipe at the upper end. This pipe was welded in place and served as a bearing for the shaft, upon which the dipperstick was hinged. The dipperstick was made up of two pieces of 6-in. I-Beam, with the webbs welded together, and a homemade hinge constructed 18 in. from the upper end of the dipperstick, welded securely in place.

As it was necessary to dig a trench with a maximum width of 26 in., a section 4 in. wide was cut from the center of the bucket, the two remaining sections then being welded together and a piece of discarded boiler-plate welded over the bottom of the bucket. The original bucket hinges were used and a bail was constructed of scrap metal found around the Highway Department barn. The total cost, including labor and purchased materials for this attachment, was \$247.



"Home-made" trenchhoe attached to 1/2 yd. shovel

How to Lubricate a Motor in 2 Minutes

A new, quick way to lubricate motors for trans-oceanic shipment, or motors to be placed in storage, has just been developed by George Frost, an employee of The Four Wheel Drive Auto Co., Clintonville, Wis.

Frost is shown here with the simple funnel and pet cock arrangement which he developed to do the job. The old method wherein each cylinder was lubricated by removing the spark plugs and pouring oil thru the openings took from 20 to 30 minutes, used a quart or more of oil, and was

never completely satisfactory. The new method does the job in three minutes, requires only a pint of oil, and provides complete lubrication.

Frost's funnel and pet cock arrangement is simply screwed into the tap in the intake manifold. The motor is started, the pet cock left partially open unitl smoke from the exhaust indicates thru passage of oil, the pet cock is then fully opened, the accelerator released and the motor automatically oils and chokes itself.



Quick treatment for motor going into storage or shipment

Worn "Crowfoot" Reclaimed by Welding

The illustration shows a dragline bucket pulling bale socket (called a "crowfoot") reclaimed by building up worn parts and hardfacing with "Abrasoweld" at a cost of approximately \$4.50. Time required is about three hours. Replacement cost would be approximately \$11.50.



Repaired dragline bucket pulling hole socket

Life of Conveyor Belts Increased by Program of Inspection and Maintenance

A report received by The B. F. Goodrich Co. from the superintendent of conveyor equipment for one of the large eastern coal companies, throws revealing light on several factors of rubber conservation by sound belt practices, so essential now because of the war and scarcity of rubber.

This superintendent, with 15 years experience in conveyor belt splicing, keeps accurate belt records. He reports that the cost of metal splices for one 26-in. belt during four years of service is \$147.20, while the cost of a vulcanized splice for the same period of service is only \$17.80, a saving of \$129.40.

Regular inspection and prompt vulcanized repair are the keystones of the superintendent's belt maintenance program, he says, and relates that previous to the installation of such a system belt life was short and replacements costly.

As examples, he cites the former service life of 48-in., 6-ply belts on loading boom conveyors, as from three to four years, while the present service life is nine to 10 years. On 42-in., 8-ply transfer conveyors at the mines, the best previous service life was four years, but since the inspection and repair program was adopted these belts have already given eight years service and are still performing.

His report recognizes the progress

made in belt construction but also declares that even with the improvements built into the product by the manufacturers legitimate service life can be obtained only by a rigid program of inspection and maintenance.

One of the unusual savings made possible, he reports, was on an 1800-ft., 48-in., 8-ply refuse conveyor belt installed in 1932. A year later it was damaged so badly that it would ordinarily have been replaced. Instead, 50 major vulcanized repairs were made, the belt has performed its regular duties since, and is expected to give at least one more year of service.

Repairing Grousers of Tractor Treads

When grousers of Caterpillar treads become worn, this contractor welds on 5/8-in. round hot-rolled bar stock with "Fleetweld 7" to the medium carbon grousers. One bead is applied on both sides. After about a month in service, when the bars have become flattened somewhat, a bead of "Abrasoweld" is applied along the top to prolong the life of the tread.



Repairing tractor tread grousers

Clean Welding Machines

Q.—Should welding machines be cleaned with compressed air?

A.—This is a good practice PRO-VIDED that the person handling the air uses a reasonable amount of precaution in directing the air stream. Dislodged dirt must not be blown past the grease seals into the bearings where it will certainly cause a lot of harm. Nothing damages a ball bearing more than dirt. But if given clean and periodic lubrication, a ball bearing should run indefinitely.

Awelding machine, of course, will run with very little attention and care. But negligence must be paid for finally and it may be a pretty expensive repair bill. Dust and dirt collects on all parts of a welded machine—both inside and out.

Preventative Maintenance for Bituminous Distributors

By WILLIAM E. WORCESTER

Kinney Manufacturing Company, Boston

The first requirement for preventative maintenance is a clean machine. A bituminous distributor naturally accumulates an unusual amount of bitumen and dust, and most of the failures in the field are due to the fact that the equipment has been allowed to get so dirty that ordinary adjustments and lubrication are neglected. Regular washing with kerosene or other solvents, and the occasional use of a steam hose and regular lubrication and inspection would prevent nearly all break downs during the operating season.

Engines .- A separate engine is provided to drive the pump. It is essential that this be kept in good condition, since the quantities of bitumen applied to the road must be accurately predetermined and these quantities are dependent upon the ability of the operator to produce a predetermined engine speed—therefore the engine must be kept tuned up, with clean spark plugs and distributor points. Radiator and radiator screens should be kept clean to prevent over heating, fan belts kept tight, and the clutch properly adjusted to prevent slippage.

During the winter overhaul, the engine should be completely inspected and worn bearings, rings, connecting rods, wrist pins, and clutch plates should be replaced. The water pump should be repacked, lube oil pump screen cleaned, crank case flushed, radiator flushed, and water hose tightened or renewed.

Heating System.—With reasonable attention, the heating system should give no trouble. Clean fuel should be used, burner tips kept clean. Be sure burners do not get loose in their settings and fire against the side of the tubes. During the winter overhaul, heating tubes should be cleaned of all accumulated soot. The outside wall of the heating tubes, that is, inside the main tank, should be checked at regular intervals of two or three months for deposits of coked material and any such deposits should be removed.

Bitumeters and Pump Tachometers.

—These instruments should not be overhauled except by skilled representatives of their manufacturers. The driving cables, adapters and bearings in the fifth wheel should be

regularly inspected for wear, and replaced before failure occurs.

Pumps.—The main pump, if not of a type self lubricated by the bitumen, should be greased regularly; wabble in the pump shaft indicates a worn shaft or a worn bearing or possibly that the pump and engine are misaligned, and calls for prompt correction.

Marked failure to apply charted quantities indicates pump wear, providing the engine is up to speed. As precision work is usually required, there is plenty of warning of internal wear, and parts should be replaced. Pumps should be packed regularly, and old packing should be replaced when the lubricant shows signs of disappearing from the packing. Dried out packing will score or cut the shaft and soon make it impossible to properly pack the stuffing box and may require a shaft replacement. Properly packed, a stuffing box need only be drawn up moderately tight. Don't get strong with a big wrench.

Strainers. — Strainers are usually provided in the suction line to the pump, and screens should be cleaned and inspected daily. If breaks exist, they should be replaced immediately.

Air Compressors. — Daily lubrication and annual overhaul are essential.

Pipe Lines.—Both the main pipe lines and the auxiliary lines for air and fuel should be inspected at least once a week. If leaks appear they should be corrected.

Operators should read their instruction books for details peculiar to some particular machine which is in their care. Keep them clean! Keep them rolling!

Repairing Steering Spindle

On a secondary road job 3 miles from Wooster, O., it became necessary to repair the steering spindle of a road grader. First, the break in the rod was butt welded with "Fleetweld" 5." Then, a ¾-in. round bar, 5 in. long, was flame heated and bent to the shape of the steering rod and was tack welded in place. The reinforcing bar was then welded top and bottom to the steering spindle.





SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE NEAREST SINCLAIR OFFICE
SINCLAIR REFINING COMPANY (Inc.)

2540 WEST CERMAK ROAD CHICAGO

d

y

e

ir st

ar is

les

of he ld" in.

to

innd

10 WEST 51ST STREET NEW YORK CITY RIALTO BLDG. KANSAS CITY 573 WEST PEACHTREE STREET ATLANTA FAIR BUILDING Ft. WORTH

ROADS AND STREETS, October, 1942

HIS BUSINESS

Attack! Attack! All guns blazing! . . . He knows his business.

In every field of human endeavor it's the "know-how" that counts.

For 37 years Raybestos has pioneered in the production and development of friction materials for every purpose . . . and now, also, for America's armed forces.

When you specify Raybestos you get friction materials that are correct and dependable because there is a Raybestos brake lining and friction specially engineered to meet the exact requirements of every make and model of machine that you operate.

Raybestos knows its business. And fastest deliveries are assured through the Raybestos net-work of local suppliers.

See your local Raybestos distributor or wire us.

THE RAYBESTOS DIVISION of Raybestos-Manhattan, Inc., BRIDGEPORT, CONN.

RAYBESTOS IS AMERICA'S BIGGEST SELLING BRAKE LINING

Ray bestoo INDUSTRIAL FRICTION MATERIALS

FOR SHOVELS . CRANES . HOISTS . TRACTORS & EARTH MOVERS

Used Construction Equipment Order Amended

(Continued from page 53)

WPB Regional Office in the region in which the equipment is located.

Issued this 28th day of September,

Ernest Kanzler. Director General for Operations.

SCHEDULE A

Buckets, clamshell. Buckets, concrete. Buckets, dragline.

Buckets, orange peel.
Buckets, scraper (bottomless), for dragline operation.

Buckets, shovel.
Cranes, crawling mounted power.
Cranes, tractor mounted power.
Cranes, rubber-tire mounted power.

Discs, road.

Disca, road.
Ditchers, blade.
Ditchers, ladder.
Ditchers, wheel.
Dragline, see cranes.
Draglines, slack line.
Draglines, walking.
Dredges and dredge equipment.
*Drilling machines, earth and rock blast hole drills

*Drilling machines, earth and rock core drills

*Drilling machines, earth and rock jack hammers

*Drilling machines, each and rock drills

Earth boring machines. Excavators, see power shovels.

Graders, blade or pull type earth mov-

Graders, elevating earth moving. Graders, under-true earth moving. Hammers, pile.

Rollers, road, tamping. Rollers, road, tandem. Rollers, road, three-wheeled.

Scrapers, carrying or hauling, both drawn and self-propelled.

Shovels, crawler mounted power. Shovels, rubber tire mounted power. Shovels, tractor mounted power.

Batching plants, contractors. Bins, construction material.

Conveyors, construction material belt. Crushers, construction material asphalt.

Crushers, construction material cone. Crushers, construction material gyra-

tory.
Crushers, construction material jaw. Crushing plants, other than stationary, construction.

Distributors, bituminous.

Finishers, bituminous. Hoists, contractors (other than trac-

tor mounted). Loaders, portable bucket type (other

than coal)

Mixers, bituminous. Mixers, concrete agitator and truck.

Mixers, concrete construction.

Mixers, paving.

Plants, asphalt.

Pumps, concrete. Screening plants, construction material (other than stationary).

Washing and screening plants, portable

Winches, contractors.

Track-laying tractors. Angledozers.

Bulldozers.

Tractor operated control units.

Internal combustion engines — Diesel and gasoline unattached.

* Except when owned by mines operating under a serial number assigned by P-56.

Grade Crossing Accident Record for 1941

The railways reported 4,320 accidents at highway crossings in the calendar year 1941. These accidents caused 1931 deaths and 4.885 injuries to persons. For the preceding year. 4,104 accidents causing 1,808 deaths and 4,632 injuries were reported. Thus the increases of 1941 over 1940 were 6.8% in deaths and 5.5% in nonfatal accidents. Train-miles increased 10.9% over 1940, and motor vehicle registration 7.3%.

Accidents involving trains and motor vehicles are classified according to whether the train strikes the motor vehicle or the motor vehicle strikes the train. The statistics show that accidents of the first class are more likely to occur in the daytime and are likely to involve relatively the greater number of fatalities. Thus, out of 2,548 accidents in which the motor vehicle was struck by a train, 64% occurred in the daytime and 33% of the casualties involved in both day and night accidents resulted fatally. But of the 1,347 accidents in which the motor vehicle struck the train. 74% occurred at night but only 14% of the casualties in both day and night accidents were fatal.

FOR GREATER STRENGTH AND SPEED

ROLLED STEEL CONSTRUCTION

An operator really makes time with a Williams Bucket on the end of his boom. A few grabs and another full loaded truck is on its way. Williams Buckets have tremendous closing power—they dig deep—bite clean and come up with heaping loads. Williams Buckets are "built to last and move dirt fast". And that's exactly what a contractor wants—long service at little maintenance cost, and fast, dependable action when moving yardage spells profits.

> If you want the full engineering story on each type and capacity of Williams Buckets, send for individual descriptive folder. You'll find ample reasons why your next bucket should be a Williams.

THE WELLMAN ENGINEERING CO. 7003 CENTRAL AVE. . CLEVELAND, OHIO Distributors in all parts of the country

WILLIAMS Buckets built by WELLMAN





About Contractors and Their Jobs

Corporation MILWAUKEE, WISCONSIN U

World's Largest Builders of Heavy-Duty Air-Cooled Engines

Kansas City Area REPORTED BY

PAUL L. MATCHETTE

E. C. L. Wagner, Secretary-Manager, Association of General Contractors of Missouri, is now located in the new A. G. C. Headquarters in the Hotel Governor, Jefferson City, Mo. The old headquarters were located in the Merchants Bank Building across the street from the Central Hotel. The new Hotel Governor has just been completed and on Sept. 24, the A. G. C. move was made.

The office is located on the street level on Capitol Ave., directly across the street from the Governor's mansion. The lobby of the hotel is located on the second floor if you enter from the Capitol Ave. side. The new headquarters are complete with a club or lounge room. Mr. Wagner is to be congratulated on the fine job that he has done in securing and arranging this new location.

O'Dell and Riney Construction Co., Hannibal, Mo., has a large contract

for roads and streets grading at the Sunflower Ordnance Plant in eastern Kansas. They have just recently been awarded a large contract for similar work at Fort Leonard Wood, Mo.

Frank L. Carswell, former President of the Missouri A. G. C., owns and operates the Midwest Paving Co. and the Midwest Precote Co., in Kansas City. Not only is Frank Carswell one of the leading paving contractors in Kansas City, but he is also one of the largest producers of crushed stone, having furnished most of the crushed stone aggregate at the Lake City Ordnance Plant, near Kansas City, and the Kansas Ordnance Plant, near Parsons, Kans. He now has a large contract for furnishing crushed stone for the Sunflower Ordnance Plant, near Kansas City.

Due to the shortage of steel, asphalt for road construction and street repairs is now being put up in card-

board cartons, H. A. Johnson, salesman for the C. F. Downey Box Co., Kansas City, Mo., applied for a patent recently on a corrugated paper box container to replace steel drums for the shipment of asphalt.

The carton holding 100 lb. of asphalt is coated on the inside to prevent sticking. Because the carton can be shipped flat, is lighter, cheaper and more easily emptied than metal containers, Johnson expects it to take the place of drums for shipment after the duration.

Kansas City will be the headquarters for the War Production Board's 7th Region in the listing of used construction machinery, in Missouri, Kansas, Arkansas and Nebraska. Thomas H. Ryan, of St. Louis, has been appointed Regional Construction Machinery Specialist for the 7th Region. He will have Sub-Specialists in St. Louis, Little Rock and Omaha. His headquarters in Kansas City is in the Interstate Building, 13th and Oak St.

Seven WPA projects in Jackson County, Missouri, were recently shut down due to the shortage of men on Army and Navy projects in the Kansas City area. One hundred and fifty WPA men on the seven projects were transferred to payrolls of contractors.

Arthur E. Everham, Director of Public Works and Reed McKinley, City Engineer of Kansas City, Mo., in co-operation with Dennis O'Harrow, of the National Resources Planning Board, and C. H. McAtee, of the Federal Works Agency, have prepared a tentative draft covering the expenditure of approximately 15 million dollars over a period of five years on public works in the City of Kansas City, Mo.

The draft is being studied by the City Plan Commission and the City Council. It will include the rebuilding and adding of an upper deck to the Armour - Swift - Burlington Bridge, which now spans the Missouri River between Kansas City, Mo., and North Kansas City, Mo.; widening and paving 39th St. from west city limits to east city limits; improve Prospect Ave. from about 5th St. to the south city limits: includes a large viaduct over the railroad tracks in Blue Valley, east of Kansas City, on 15th St. and includes the expenditure of around 2 million dollars for the re-

t-

er al to

nt

ri, ta. as icth

is nd

nit

he

surfacing of different streets throughout the city.

Besides the roads and streets improvement, other departments such as Police, Health, Fire Department, Water Department and Parks will receive substantial amounts. This entire program is being planned so as to help take up the slack directly after the duration. The city has other projects amounting to approximately 35 million dollars which may be included later if the need arises.

W. J. Lewis, President of L. W. Lewis Sons, one of the largest and oldest crushed stone producers in the State of Kansas, recently announced the sale of their holdings to the Ellison Road Construction Co., of Carthage, Ill. One of the largest holdings of the Lewis Company is the Garnett Quarry at Garnett, Kansas.

Not only have L. W. Lewis Sons furnished large amounts of crushed stone for highway work throughout Kansas, they also are large shippers of agricultural lime dust and were one of the largest producers of ballast for the Santa Fe R.R.

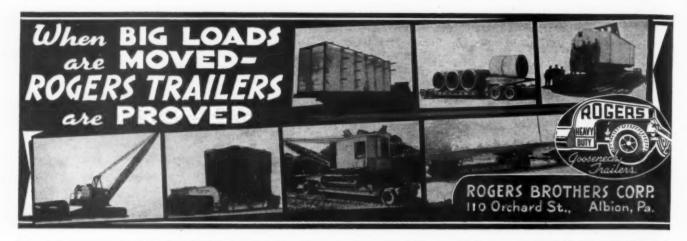
The Kansas State Highway Commission has approved the rerouting of several highway locations due to war projects. This includes the rerouting of Kansas highway No. 10 near De Soto, Kan., a distance of approximately 1-2/3 miles. The Highway Department is also approving several speed zones, one near Coffeyville, Kan. and one between Manhattan and Ogden, Kan. "No passing" zones have been established in the vicinity of Garden City and Dodge City, on highway No. 50S.

Glenn Rippey is now District Engineer of the Portland Cement Association, with headquarters at Oklahoma City. For the past ten years, Glenn has been Field Engineer for the Association in Tulsa and northeastern Oklahoma. He is one of the best-liked men in the construction field in Oklahoma, and all of his friends are pleased to see him in his new position.

He joined the staff of the Association in 1925. Then, in 1931 and part of 1932 he was associated with the city engineering department of Oklahoma City. He rejoined the Portland Cement Association in 1932. He is an outstanding engineer and is well qualified to handle the work that his position requires.

They're Putting Down the Ground Work for Victory!





"Berg" Hi-way Surfacers



The model illustrated is a one-man, gasoline driven machline, for surfacing concrete roads, streets, floors and other concrete naving. paving.

The Power Take-Off is an EXCLUSIVE FEAan EXCLUSIVE FEA-TURE, permitting at-tachment of "BERG" Flexible Shaft Equip-ment for surfacing walls, bridges, culverts, etc.

Write Dept. C

The Concrete Surfacing Machinery Co.

CINCINNATI, OHIO

DIRT MOVING EQUIPMENT

Highway construction involves more dirt moving than any other branch of engineering construction. ROADS AND STREETS, the only national engineering construction magazine devoted exclusively to, and covering all sections of, the highway field is the most effective and economical medium through which to sell dirt excavating, grading and hauling equipment.

PERSONAL ITEMS ABOUT ENGINEERS

Lester M. Corey has been appointed by Pierce county (Wash.) commissioners as county road engineer to succeed E. A. White who resigned recently to accept a position with the state highway department. The new road engineer was born in Tacoma in 1891, was graduated from grade and Stadium high there and attended Whitworth college. He was a railroad engineer for a number of years, engaging in construction work, also an I. C. C. valuation engineer, and later was engaged in maintenance work. Corey has been with the county since 1924, when he was made a deputy county engineer, and since the abolishment of that office as an elective position, has been assistant road engineer.

Commissions to active duty with stations at the Seattle, Wash., office of the United States army engineers for two Seattle men, Capt. George F. Hopkins and Lt. Elmer H. Elwin, have been announced by Lt. Col. Donald P. Booth, executive officer of the Seattle engineer district. Captain

Hopkins studied engineering at the University of Washington. Engaged in surveys for locating logging railroads from 1922 to 1928, was a consulting engineer prior to joining the U.S. army engineers, in 1930 as head of field surveys, soils and utilities investigations and real estate. He will be officer in charge of field studies for the Seattle district. Lt. Elwin is a civil engineering graduate of North Dakota State college where he later was an instructor in freshman engineering. Employed by the U.S. fish and wild life service from 1935 to 1940, he was with the Bonneville project before joining the Seattle district as a civilian engineer for Alaskan and other area projects. Lt. Elwin will serve as assistant to the chief of the Alaska operations division for the district.

Assignment to active duty with the corps of engineers is announced for Capt. Sidney C. Dean and First Lieutenant Noble A. Bosley, both of Seattle, Wash. Capt. Dean will serve as assistant to Capt. Charles A. Jackson, Jr., upper Columbia area engineer, with offices at Wenatchee. Lieut. Bosley will serve as assistant to the chief of the district engineering divi-

Several promotions and leaves of absence have been arranged recently in the Missouri State Highway Department. Ben F. Leslie, Assistant Engineer of Surveys and Plans, has been appointed acting Division Engineer for Division No. 2, at Macon, Mo. A. L. Wallace has been appointed Assistant Engineer of Surveys and Plans to succeed Ben Leslie, Roy H. Dagen, Assistant Engineer of Materials, has recently taken a leave of absence to be in the building materials branch of the War Production Board, at Washington. His job is the determining of the availability of aggregates for use in war construc-

William E. Grubb, formerly liason man between the Missouri State Highway Department and the Public Roads Administration, is now a Captain in the Army and has recently been transferred from the O'Reilly General Hospital, Springfield, Mo., where he was Area Engineer, to a new Army project near McCook, Neb.

New Trade Literature

Spray Nozzles. - Chain Belt Co., Milwaukee, Wis., has issued a new illustrated folder describing its Rex spray nozzles. The illustrations of this ingenious device in the folder show various uses. The nozzle is described as a non-clogging device which throws a flat fan-like, hard-hitting spray with such force that it removes dirt and grit from the most irregular surfaces. The high velocity spray is so concentrated that it produces an extremely thin line of impact which amounts to a sharp cutting action. The device was originally developed for cleaning traveling water screens and because of its unusual effectiveness has since been adapted for many other purposes. The folder is known as Bulletin No. 409 and will be sent on request by Chain Belt Company, 1600 West Bruce St., Milwaukee, Wis., to anyone interested.

"Blue Bond Masonry."-A small booklet, issued by the North American Cement Corporation, New York, N. Y. Included among the material are reference tables for determina-

ut. he

of tly eant

nas

gi-

on.

ted

ind

H.

te-

of

te-

ion

the of

uc-

son

tate

blic

ap-

ntly eilly Mo.. o a

Neb.

tion of mortar quantities and the number of masonry units required for various types of construction.

"Unsung Heroes of the War" .-- A 24-page booklet, interestingly written and attractively illustrated, issued by the Baker Manufacturing Co., Springfield, Ill. The booklet deals with that "Handy Andy" of construction units, the bulldozer, and its companion unit the gradebuilder. It recounts their history and development and tells in word and picture the important part they have played in the war-construction effort. In addition the booklet describes, and depicts in on-the-job shots, the various other units in the Baker line of construction units, maintainers, rooters and snow plows.

"All Out for Victory" is the title of an attractive four-color booklet issued by the Galion Iron Works & Manufacturing Co., Galion, Ohio, in which are told the facts relating to Galion's contribution to the war effort. The entire output of Galion road machinery, the booklet states,

Cu. Yd.

"goes to the national war effort, to build, improve and maintain roads. To prepare the groundwork for airfields, cantonments, war plants and housing projects." Pictures of some of the Galion units, in colors, are shown with a brief resume of the outstanding tasks they are being called on to do in answer to the call for speed, and more speed, in our huge war-building program.

Rust Preventing Paints.-A 20-page catalogue on rust preventive paints has just been released by the Rust-Oleum Paint Corp., 2425 Oakton St., Evanston, Ill. It contains directions for the proper application of rust preventive coatings, color chips illustrate the variety of products available, and explanations of where and how these materials may be used to insure maximum protection. The catalogue includes descriptions of special coatings designed to inhibit the corrosive action of fumes, humidity, brine, etc., and special applications to be used where wide variation in temperature require unusual elasticity. There are also brief catalogue descriptions of industrial wall and floor enamels for inside and outside use, house paints, asphalt paints and sealers.



tres and gayest night clubs. In the hub of the City's social and cultural district, it offers an unusually central place to stay while in town. Here, spacious rooms, superb service, a quiet and refined atmosphere, and excellent cuisine, make for dignified living.

A. S. KIRKEBY, Managing Director

he Gotham 5th Avenue at 55th Street . New York City



Lift

FRONT END SHOVELS

for Industrial Tractors Write for Catalog

Elkhart White Mfg. Co. Indiana

GRUENDLER'S FIFTY-SEVENTH YEAR

For Access Road and Air Base Construction

PORTABLE CRUSHERS

Proper Size Aggregates--on the Job

Balanced, Non-Tipping. Expertly designed to meet your exact requirements in proper size aggregates—larger capacity and quick mobility to and from job.



GRUENDLER CRUSHER & PULVERIZER CO. 2915-21 N. Market St., St. Louis. Mo.

No. 601

New Equipment and Materials

Develops Treatment to Prevent Mildew

The technical laboratory of the Albi Chemical Corporation developed and patented a treatment under the trade name of PROTELA SB, which, it is claimed, extends the life of fabrics of vegetable origin, such as jute, cotton, linen, sisal, hemp, paper, etc., by incorporating into the material a fungicidal compound which inhibits mildew deterioration when subjected to conditions of heat, high humidity and weathering. The necessity for a compound with effective permanent resistance to outdoor weather exposure is most important as materials such as tentage, tarpaulins, canvas, rope, etc., must withstand alternating conditions of humidity and sunlight, under which conditions mildew most easily develops. Thus, the need for a relatively insoluble compound contained in the interior of the individual fibers is paramount to obtain relative permanence of the mildewproofing effectiveness, even after severe conditions of weathering.

PROTELA SB has been accepted by the Engineers Corps for the treatment of burlap for sandbag fabrication, and a number of finishing concerns have been using this compound for present Government contracts, for the past year and a half its manufacturers state.

The compound is applied in a water solution and can be readily handled by the man-on-the-street, as well as by industrial finishing concerns. The treatment consists of a thorough wetting of the fabric or material, followed by wringing and air drying.

Among the many varied uses to which PROTELA SB is being applied are roping, cotton, sisal, paper wrapping, tobacco shade cloth, fire hose, shade material, tentage, deck covers, awnings, etc. Wherever the manufactured item is in contact with severe weathering, or humid conditions, especially those of the tropics, this compound has found satisfactory usage, it is claimed.

New Attachment Speeds Guard Rail Construction

The Novo Pavement and Concrete Breaker has a new attachment for speeding the digging of post holes for highway guard rails. A heavily rein-



Post hole attachment for Novo pavement Breaker

forced pointed cylinder punch placed on the end of the 3300-lb. hammer in place of the breaking nose, has been successfully used on various types of grades where guard rail posts are to be placed. On the average only three blows of the hammer are required, it is claimed, to put down the post hole with this punch, saving considerable time and labor on this operation. Two hundred post holes can be dug in an average day, according to the manufacturers.

This accessory can be used on any of the Novo breakers in the field or furnished with a new outfit. It increases by one more job the operations the Novo Breaker is used for, such as breaking out all kinds of pavement on repaving and relocating jobs. Also furnished with a special cutting nose, it can be used for cutting trenches in the pavement without spoiling the rest of the street. A long blade can be used on the hammer for cutting (frost) frozen ground on winter digging jobs. The fact that this machine can be mounted on an old truck that is beyond use on other operations is especially important at this time, its manufacturers point

Over 75% of Steel Output Goes Into Direct War Use

More than 75 per cent of the nation's steel output of 5,300,000 tons a month now is going into direct war use and the remainder into such essential industries as railroads, machinery manufacture, and the like.

Eighty per cent of our steel is being delivered on ratings of A-1-a or higher.

The 5,300,000 tons a month currently being delivered represents finished steel products, a reduction of approximately 30 per cent from ingot production of more than 7,000,000 tons. In terms of plates and shapes, sheets, bars, pipe, wire, rails, and the like, the United States this year will turn out about 62 million tons. This is slightly more than 70 per cent of the 86 million ingot tons the nation is expected to produce. The remaining 30 per cent goes back into the furnaces in the form of scrap.

This is the way the nation's ingot production has grown since 1939:

1939											0	0				.52,798,714	net	tons
1940																66,982,686	61	44
1941																.82,927,557	08	48
1942		_	_	1	F	è	ιŧ	1	n	15	a	ta	N	1	١	86,000,000	98	64

To make this increased production possible, steel-making capacity, that is, rated capacity as distinct from actual production, has been stepped up correspondingly. At the end of 1939, it was 81 million tons; 1940, 84 million; 1941 88 million. By the end of 1942 capacity probably will reach 93 million tons and by mid-1943, 98 millions.

Current production is far ahead of the best the Axis nations can do, including the German-controlled countries of Europe. Axis steel production was approximately 74 million ingot tons in 1941. The United Nations that same year controlled more than 65 per cent of the world's steel output.

Five million tons of finished steel a month—where does it all go?

Into tanks; it takes about 38 tons of steel to make a medium tank and the United States is turning out a lot of them.

Into ships: present goals are for 8 million tons of dead-weight shipping this year and 16 million tons in 1943. Each cargo ship of the Liberty type now being made in quantity under direction of the Maritime Commission calls for approximately 4,500 tons of rough steel. Current production is around 70 ships a month.

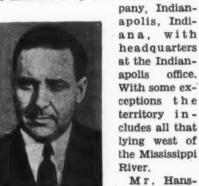
Into planes: The big four-engine bombers take 15 tons of steel each. Fighter planes take $3\frac{1}{2}$ tons and the other types fall in between.

Into guns: some of our anti-air-craft guns use up 14 tons of steel each; thousands of rifles, machine guns, anti-tank guns, and howitzers use steel, all the way up to the giant 16-inchers that take 576 tons of steel each.

With the Manufacturers

Ray Hanspeter is Western Sales Manager for J. D. Adams Co.

The appointment of Ray Hanspeter as Western Division Sales Manager is announced by J. D. Adams Com-



peter has been Ray Hanspeter with the com-

pany for more than eighteen years, serving successively as salesman, branch manager, and district manager, and has won widespread respect and confidence among highway officials and contractors because of his intimate knowledge of their road-building and earth-moving problems.

Correction: In error the picture of Mr. Hanspeter was used on page 83 in the September issue, bearing the caption "W. C. Hardie," in a news item which told of the formation of the Industrial Equipment Co., at Billings, Mont., of which company Mr. W. C. Hardie, the Adams Billings Manager for several years is Vice-President and Manager, to handle the sales and service of Adams equipment in Montana and Wyoming.

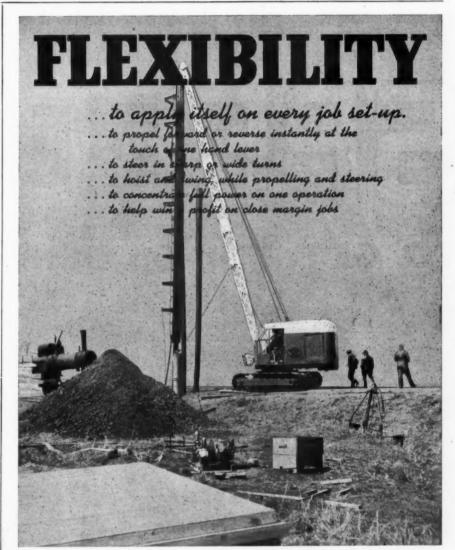
Universal Crusher Company Changes Name

The Universal Crusher Company, a Delaware corporation, with factories and general offices at Cedar Rapids, Iowa, on Oct. 1, 1942, has become the Universal Engineering Company, organized under the laws of the State of Iowa. The Universal Crusher Company was founded in 1908 and is credited with being the first manufacturer in the United States of overhead eccentric jaw crushers. Practically all that will be changed is the name since the officers, executives and personnel remain the same; and nothing is being eliminated from the line of equipments manufactured by the original firm, A. W. Daniels is presi-

dent, H. F. Rikhoff, secretary-treasurer; A. H. Sargent, vice-president: L. S. Hackney, sales manager and L. W. Dunlap, assistant to the president. It is felt that the new corporate name is more comprehensive, and will be in keeping with the present and future activities of the organization.

Independent Pneumatic Tool Co. Awarded "E" Pennant

The Aurora, Ill., plant of the Independent Pneumatic Tool Co. was presented with the Army-Navy "E" award October 8. The City Council of Aurora had proclaimed October 8 as the Army-Navy Day and in a program of special events tribute was paid to the armed forces on all fronts as well as to the workers on the home front. High ranking Army and Navy officers and other celebrities took part in the to serve at least one more year.



Byers full circle shovels and cranes will Hoist, while they Swing, while they Travel, while they Steer. Do you realize what this means on your jobs?

or instance, a dragline digs a section of ditch few minutes. Then it moves back to the next If it's a Byers, it moves back while the rator is swinging to dump the last bucket load.

Time saved, money saved, many times a day!

Or, maybe you've heard an operator cuss when he needed to swing a long boom to one side while steering in the opposite direction. He can de this easily, quickly with a Byers because it swings freely while traveling.

This is another reason why you should investigate Byers % to % yd. excavators.

Modern CRANES and SHOVELS

Universal Atlas Cement Co. Appoints

Blaine S. Smith, President, Universal Atlas Cement Co., United States Steel Corporation Subsidiary, announces the following appointments: Paul C. Van Zandt, Vice-President, Operating and Engineering, who has resigned, is appointed Consulting Engineer with offices at 208 South La Salle St., Chicago; Henry P. Reid, Operating Engineer, is appointed Assistant to President, New York; Louis M. Funderburg, Superintendent, Leeds, Alabama, plant, is appointed Operating Manager, New York, succeeding Leonard

Wesson, deceased; Henry C. Schmielau, General Auditor, is appointed Comptroller, New York.

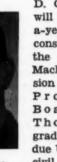
Mr. Van Zandt has had 40 years' engineering, design and operation experience in the cement manufacturing field in the United States, Canada, Mexico, Cuba, Japan and China, and has built and started operation of a number of cement plants and waste-heat power plants. He is the author of a number of technical papers on the cement industry in the Orient, a graduate in mechanical engineering from Purdue University and a member of the American Society of Mechanical Engineers

Mr. Reid has been with the company for 19 years as special engineer and latterly as operating engineer. In his work with the company's cement plants he has dealt particularly with kiln operations, fuel economy, and rock and clinker grinding. Mr. Funderburg, who has been with the company over 18 years, became assistant superintendent at Leeds in 1930 and superintendent in 1936, J. P. Camm, assistant superintendent at Leeds, succeeds Mr. Funderburg as superintendent. Before coming to the Leeds plant he was superintendent of the company's gypsum operation at Watonga, Oklahoma.

In 1911 Mr. Schmielau joined the Universal Atlas Co. and served successively as clerk, bookkeeper, assistant secretary, assistant treasurer and general auditor, prior to his appointment as comptroller.

A. W. Thomas, Chain-Belt Co. Joins WPB Committee at Washington

A. W. Thomas, Sales Manager, Construction Machinery division of Chain Belt Co., has left for Washington,



A. W. Thomas

D. C., where he will be a "dollar-a-year" man as consultant for the Construction Machinery division of the War Production Mr. Thomas is a graduate of Purdue University in civil engineering and has been

with Chain Belt Company for fifteen years, serving on both the engineering and sales staffs. During his absence, his duties will be taken over by Mr. D. A. Kalton, Assistant Sales Manager of the Construction Machinery Division.

Independent Pneumatic Tool Co. Branch Offices at New Locations

The Independent Pneumatic Tool Co., manufacturers of Thor pneumatic and electric tools, announces new locations of its branch offices at Boston, Mass., and Birmingham, Ala., and the appointment of a new Boston branch manager. The Boston office, now managed by Mr. Vance G. Turner, has moved to 78 Brookline Ave., and the Birmingham office has moved into its own new, modern home at 1411 North Third Ave.



There is no time for waste motion in this day of "giving it everything you've got". SCHRAMM, with a long record of superior performance, is ready to cope with all production problems. For instance...take SCHRAMM'S POLICY of basic design in building a compressor that is light in weight... is compact...has automatic controls and force-feed lubrication... is self starting... is powered with both gas and diesel...

and above all, is designed for economical engine speed that means . . . LONG LIFE!

If you want to get things done "Do It The SCHRAMM Way". Gasoline, Diesel or Electric Powered from 20 to 420 cu. ft. actual air.

SCHRAMM INC. AIR COMPRESSORS WEST CHESTER, PA.

SCHRAMM-THE COMPRESSOR PEOPLE

ROADS AND STREETS, October, 1942

Marion Receives Maritime Award

The Marion Steam Shovel Company, Marion, Ohio, has been awarded both the Victory Fleet Flag and the "M" Burgee for outstanding achievement in the Nation's war production effort.

Notice of the award was received at Marion by wire recently, which reads as follows: "As chairman of the U. S. Maritime Commission Board of Awards, I take pleasure in advising you that the board, in recognition of your outstanding production achievement, has awarded your plant the Maritime "M" pennant and Victory Fleet Flag and Maritime labor merit badges for all your employees." It was signed by Admiral H. L. Vickery, Commissioner of the U. S. Maritime Commission at Washington, D. C.

The "M" pennant and the Victory Fleet Flag was presented to The Marion Steam Shovel Co. by an officer of the Maritime Commission in a ceremony on October 5.

The company has been building cranes for the Maritime Commission varying in capacity from 3 to 43 tons. These are mounted on steel portals or frames and are used in shipbuilding and for loading and unloading ships.

The Marion Steam Shovel Co. officials said the award came about largely because plant workers had made it possible to keep shipments of crane units to the Commission in advance of schedules. They emphasized that the award is primarily a tribute to the energy and cooperation the shop employes have put into their production work.

The company also is producing similar cranes for other governmental departments, and too, is manufacturing shovels for many large industrial defense plant projects in the United States and other countries. Many Marion shovels are used for mining iron, copper, aluminum and other vital products for the industrial war effort. The company's products go to these war industries and also directly to the Maritime Commission, the War Department, and the Navy.

The Marion Steam Shovel Company has been engaged entirely in war work for more than a year, and its employment now is nearly 2500, a peak.

Marion is the first in the Marion area to receive the Maritime Commission award and is one of few in Ohio to be given the pennant. A similar type of award is given by the Army and Navy in the form of the Army-Navy "E" pennant.

M. M. Maxwell Joins Engineering Staff SPA

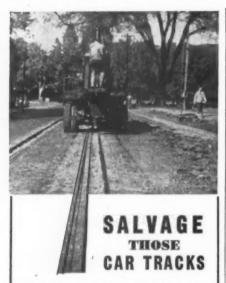
The field engineering staff of the Southern Pine Association, New Orleans, La., has been enlarged to service the increasing number of calls for recommendations with regard to the use of lumber in engineered construction, it was stated by H. C. Berckes, Secretary-Manager, in announcing the appointment of M. M. Maxwell to the field engineering staff of the Southern Pine Association.

Maxwell, since his graduation from Tulane University in 1931, has had varied experience in designing, estimating and construction of timber structures. One of the principal activities of Maxwell will be working with architects and engineers on matters concerning the use of timber design.

W. T. Hedlund Heads Elastic Stop Nut Corp.

William T. Hedlund has been named president of the Elastic Stop Nut Corporation, Union, N. J., makers of self-locking nuts. Mr. Hedlund, who has been a director of the company, was formerly vice-president of the Electrolux Corporation in charge of engineering.





THE RAPID PAVEMENT BREAKER is unequalled in performance for breaking out car tracks.

Also used for demolition of— Roads ● Bridge Decks ● Foundations ● Tamping ● Breaking Frozen Ground.

CONCRETE CUTTING CORP.

607 DeGraw Street Brooklyn, N. Y.

OSGOOD



TYPE 20

the biggest value in the ½ cu. yd. class. Available as shovel, crane, dragline, etc., on crawler, truck or pneumatic tired wheelmount.

Write for Catalog and Specification.



Barber-Greene Awarded Army-Navy "E"

In impressive rites staged before a trainload of ditching, airport paving and other Barber-Greene construction equipment en route to United Nations' bases throughout the world, the 700 Barber-Greene employees at the Aurora, Ill., plant were awarded the Army-Navy "E" for excellence in war production.

To each of the shop and office employees went a sterling silver "E" pin termed by Colonel A. Robert Ginsburgh of the Army General Staff at Washington, who flew West to make the first such award to a Fox Valley plant, "a military decoration conferred for conspicuous contribution to the war effort."

Holloway for the office employees, to receive from himself, representing the army, and from Lieut. (j.g.) Arthur Griswold of the naval reserve, the "E" pins. Later each employee was called up for an "E" pin and all were proudly wearing them today.

Ashley Barber, Vice-President, presided at the impressive ceremony. The acknowledgment for the "E" award fell to shopman W. H. Sturm of the employees who briefly bespoke the pride with which the B-G family will wear the "E" pin and to W. B. Greene, Vice-President and Treasurer of the company.

"Yes, we are very proud," said Mr. Greene, "so let us strut our little hour. But let us also beware our pride. There are greater problems ahead. We have been fortunate so



Coveted Army-Navy "E" banner being awarded the Barber-Greene Company at impressive rites held before a trainload of equipment destined for the allies' bases throughout their world. Those participating in the exercises, pictured above, are, left to right; Maj. Emil Gemmer, Illinois reserve militia, holding banner; Colonel Ginsburgh, military aide to Undersecretary of War Patterson; Charles Card, who received flag as employes' representative; W. H. Sturm, shopmen's representative to receive first "E" pin; Lieut. (j.g.) Arthur Griswold, naval reserve; Mabel Holloway, office girls' representative to receive first "E" pin; D. G. McIlwraith, secretary of company; Lieut. (j.g.) Berwanger, navy air force; W. B. Greene, vice-president and treasurer of company; Ashley Barber, vice-president of B-G and master of ceremonies; his father, H. H. Barber, president of B-G and designer of equipment; Joe Hardy, a shopmen in kilts he wore as a member of Scottish regiment in World War I

"Your government," said Colonel Ginsburgh, "the War and Navy Department, are proud of you." The flag, containing the famed "E" in white in a circle of golden oak leaves, was hoisted beneath Old Glory by a color guard commanded by Capt. Roland Avery of the Barber-Greene guard and including Maj. Emil Gemmer of the Illinois reserve militia, a shopman, and Joe Hardy, veteran of a Scottish regiment, in the kilts he wore in World War I.

Colonel Ginsburgh called two employe representatives, W. H. Sturm for the shop workers, and Mabel

far in having found our way to serve, in being able to use much of our own past experience, most of all, fortunate in our privilege of working freely, as free men, in this our democracy. The typical American boy is not born with a silver spoon in his mouth, but rather with a monkey wrench and a pair of pliers in either hand. So in the habits of a people and in our industrial organization we have been preparing for 100 years. Let us hope, that through our own initiative, we may continue to find our avenue of greatest service and that our discipline may make us all good soldiers."

W. B. (Bill) Elliott Heads Own Equipment Company

A new equipment distributing concern, the W. B. Elliott Co., has opened for business in the Chicago territory. The new company, headed by W. B. (Bill) Elliott, sales manager of the excavator division for the Koehring Co. for several years. Mr. Elliott opened offices at 1323 Conway Bldg.. 111 W. Washington St., Chicago, and will open offices immediately at Davenport, Ia., and establish a warehouse in Chicago for complete rebuilding and overhaul of construction equipment. Mr. Elliott's son, Bill, Jr., will be associated with him for a while, but will be leaving soon to join the armed forces of the United States. either with the navy or the army. The new company will act as distributors for the Koehring Co., Kwik-Mix, the Parsons Co., C. S. Johnson Co., Broderick & Bascom, Owen Bucket Co., and manufacturers of small tools.

Standard Oil of Indiana Will Pack in Glass Instead of Tin Cans

Tin plate sufficient to make 2,000,-000 tin cans of No. 2 size for military rations per year for the duration will be saved for the war effort by the action of the Standard Oil Company of Indiana in substituting glass bottles for tin cans in packaging certain petroleum specialty products and lubricants. Sprays, polishes, auto cleaners and waxes and cream separator oils are among the products packaged in tin cans which Standard will market in the future in glass bottles. Bottles will be made in one gallon, one-half gallon, one quart, one pint and one-half pint sizes.

Standard of Indiana's substitution of glass bottles for tin cans, as was the company's recent development of a plywood "Victory Drum" to save steel in packaging greases, is in accordance with the program of the Petroleum Coordinator for War for the conservation of containers.

Wellman Engineering Co. Receives Army-Navy E

The Wellman Engineering Co., Cleveland, Ohio, was a recipient of the much-coveted Army and Navy E award for its speed and efficiency in construction of a series of giant dry dock cranes to be used by the government in building warships.

Captain H. G. Taylor of the United States Navy, Bureau of Yards and Docks, presented the flag to A. E. Gibson, president of the company. He emphasized that in presentation of the award to manufacturers such as Wellman Engineering, the Army and Navy gave emphasis to both quantity and quality of production. He said the Navy has placed "utmost dependence" upon the huge cranes, which are some of the largest ever constructed. The cranes, free to move so they may travel all about the docks, have their own diesel power plants. Mr. Gibson accepted the E pennant and stated such an occa-



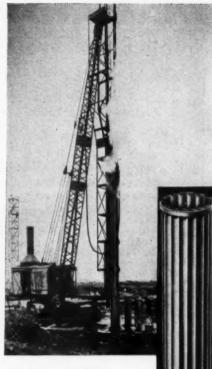
A. E. Gibson (left), president of the Wellman Engineering Company and G. W. Burrell (right), before the microphone as the E flag is unfurled on the stage

sion was a "sobering" one. "Frankly, I have no patience—in this critical period—with peace-time curtailment of hours of work," he said. "The need demands more and greater effort and sacrifice. There is none of us who, with a determined effort, a real understanding of the desperate and efficient foes we face, cannot produce in quantity vastly more than in the past."

The ceremony took place before a gathering of Wellman employes on a stage with a background of flags of the United Nations. On the stage were officers of Wellman Engineering, the Army and Navy, city officials and others. E pins were presented in behalf of company employes by Captain L. N. Moeller of the Bureau of Yards and Docks to Daniel W. Edwards, employed by the company for 40 years, and Miss Olive Scheer, veteran of 31 years of service. G. W. Burrell, chairman of the board of the company, presided at the ceremonies.

Public Works Congress to Meet Oct. 18

The 48th annual conference of the American Public Works Association, to be held at the Hotel Statler in Cleveland, Oct. 18-21, will serve as a clearing house of essential information regarding war-created problems.



When TIME
Everything
means MONEY

MONOTUBES

Four features to help you beat construction deadlines, produce foundations faster and at less cost:

QUICK Hundling. Monotube steel casings are light in weight for fast and economical handling.

2 FAST Driving. Tapered Monotubes are strong and rigid, require no heavy core or mandrel, and can be driven with average job equipment.

3 SPEEDY Extension. By using Extendible Monotubes you can install varying pile lengths without delay—even in low headroom.

4 EASY Inspection. Tubular design permits quick, thorough inspection of the casing from top to toe before concreting.

Monotubes are supplied in gauges, tapers, and sizes to meet the most exacting requirements in any soil condition. Write for catalog.

Remember-"More Production means Axis Destruction!" -

The UNION METAL MANUFACTURING CO. Canton, Ohio

BE READY WHEN SNOW COMES



ROSS SNOW PLOWS with their "Sno Flo" moldboards will move more snow and do it with less power. They will last longer if kept in good repair. Plows should be thoroughly overhauled now and none but genuine Ross repairs used. We will not be able to furnish plows except on a high priority.

Ross plows and repairs are built by

THE BURCH CORPORATION

Crestline, Ohio

BUY DEFENSE BONDS TODAY

SAUERMAN



Sauerman Drag Scraper and Portable Gravel Plant

PROFITS in digging and hauling sand, gravel, clay, blasted rock, etc., depend on using the simplest equipment that will handle the required yardage in the shortest space of time.

Often this means using a oneman operated Sauerman Drag Scraper or Slackline Cableway. The Sauerman system of moving materials adapts itself to any ground conditions and provides fast handling on any haul up to 1500 ft.

Write for Catalog

SAUERMAN BROS., Inc.

588 S. Clinton St., Chicago

Show Room Now a U. S. Army Class Room

Caterpillar Tractor Co.'s huge show room, 350 feet long and 108 feet wide, known as one of the largest of its kind in the world, has been sacrificed to the pressing demands of 100 per cent war production. Weeks ago enlargement of the United States Army Training School at "Caterpillar" necessitated the use of nearly half the show room so that men attached to the U. S. Engineers might have plenty of equipment with which to work.

Now, due to additional demands for floor space, the remainder of the show room has been converted into

Wis., now fly the joint Army-Navy Production Award flags. Brigadier-General Joseph E. Barzynski, Commanding General, Chicago Quartermaster Depot, lead the parties making the presentation of awards at the Illinois Manufacturing Division plant in Waukegan, Sept. 12, at 9:30 a.m., at the Wisconsin Axle Division in Oshkosh at 2:45 p.m. the same day. In presenting the Award flag at Detroit, he spoke of his long association with Timken during the last post-war period when the company cooperated in motorizing and mechanizing the U. S. Army. R. J. Goldie, Timken vice-president, accepted the award for the company. Colonel Besse, Fort Sheridan, Ill., presented the Award



Caterpillar's huge show room, showing section given over as a classroom for students of U. S.

Army Training School

a store room for the Road Machinery Division.

The show room has for years been an impressive sight as it greeted visitors to "Caterpillar," Peoria, Ill. Liberally stocked with Company products, huge pictures and other items of interest, it was admired by guests who hailed from all corners of the world.

With every manufactured item now going into the all-out fight for freedom, and governmental regulations barring admission of the general public to the plant, "Caterpillar" decided the huge room could be put to more effective wartime use by devoting its great floor space to the Army Training School and storage purposes.

Timken Plants Awarded Production Award Flags

For high achievement in the production of axles and other vital equipment to keep the U. S. Armed Forces rolling to Victory, The Timken-Detroit Axle Co.'s three plants, in Detroit, Waukegan, Ill., and Oshkosh,

flags at Timken's Waukegan and Oshkosh plants, and Walter F. Rockwell, president, received the award, in behalf of the company. Lieutenant-Colonel John Newton Gage, executive officer, Chicago Quartermaster Depot, made the token presentation of "E" Award pins to employees at the daytime ceremonies at the three plants, and Major W. W. Gildersleeve, of the Chicago Quartermaster Depot, presented the pins at the Detroit night ceremony.

HO

FOR

391 PH

Changes Name to Ransome Machinery Co.

The former Ransome Concrete Machinery Co., Dunellen, N. J., is now known as the Ransome Machinery Co. The company will continue to manufacture the same products with which it has been identified in the past: 34-E single and dual drum pavers, truck mixers, central plant mixers, and small mixers. No changes in management personnel have been made.

RELIANCE

CRUSHING, SCREENING and WASHING UNITS

O Up to 2000 Tons a Day O

Crushers Elevators Sweepers Screens

Bins
Pulverisers
Feeders
Spreaders
Kettles
Conveyors

Drag-Lines
"GAYCO"
Centrifugal
Air Separators

UNIVERSAL ROAD MACHINERY CO. Kingston, N. Y.

Canadian Representatives: F. H. Hopkins & Co., Ltd. 340 Canada Cament Co., Montreal, Que., Can

THAW CULVERTS AND HYDRANTS WITH AN AEROIL



A handy steam plant with a detachable thawing torch. Used by leading Highway Departments for Culvert Thawing. Special Culvert Nozzle (10 ft.) available. Send for WINTER CATALOG No. 2345 including Concrete Heaters, Portable Coil Water Heaters, Thawing Torches, Ground Thawers, Salamanders, Tar and Asphalt Heaters, etc.

1917-1942—25 YEARS OF SERVICE

AEROIL BURNER CO., INC.
5711 PARK AVE. WEST NEW YORK, N. J.
Branches: Chicago, San Francisco, Dallas

HOTEL PHILADELPHIAN FORMERLY HOTEL PENNSYLVANIA

DANIEL CRAWFORD, JR., Mgr. 39th and CHESTNUT STREETS PHILADELPHIA, PENNSYLVANIA

Our courteous and competent staff will give you the utmost in friendliness, comfort and service. Conveniently located to all stations, and only five minutes away from the heart of the business section.

600 ROOMS
Each with bath from \$3.00 up
RADIOS IN EVERY ROOM

Lounge and Restaurants Unrestricted Parking to 3 a.m.

Coronach

(Continued from page 66) and harbor works in Chicago, San Francisco, the Philippines and Hawaii.

ALBERT P. HANAN, vice-president and general manager of the Detroit Asphalt Paving Co., September 19, 1942. Mr. Hanan was known for his enthusiasm and skill as a road builder. Beginning work with the Barber Asphalt Co., at the age of 16, he progressed rapidly, and became known as an expert-especially on asphalt construction. Early in his career, the Barber Company sent him to Chile, and later he became associated with a Brazilian firm. His association with Detroit Asphalt Paving Co. dated from 1916. Mr. Hanan was a member of the American Road Builders Association, the Michigan Road Builders Association, and the Asphalt Institute of Technology.

JOHN W. CHILDS, bridge engineer for the New Hampshire State Highway Department, September 23, 1942, Mr. Childs was a graduate of Dartmouth College, and had been with the state highway department for 23 years, serving as office engineer and later as division engineer with headquarters at Littleton. He was appointed bridge engineer in 1925 and served in that capacity until his death. He was a member of the New Hampshire Good Roads Association, of which he was a past president, the American Society of Civil Engineers, the American Association of State Highway Officials, and the Association of Highway Officials of the North Atlantic States. His home was at 39 High Street, Goffstown, N. H.

George S. Davison, Chairman, Pittsburgh Coke and Iron Co., October 3, 1942. Mr. Davison's death at the age of 86 ended an unusually active career. Graduating from Rensselaer Polytechnic Institute in 1878, he was first engaged in railroad construction, and later in other branches of engineering.

Martin Hardsocq, aged 90, founder of the Hardsocq Wonder Drill Company, Ottumwa, Ia., died October 2. Mr. Hardsocg was the inventor of several types of air drill used in the highway and mining fields.

CUT MOWING COSTS



With SILVER KING
Do fast, economical moving on the level or in the rough with Silver King, the moving unit that's ENGINEERED for the job. Write for details.

THE FATE-ROOT-HEATH CO.

The Favorite Mowing Unit for City, County and State Highway Departments



VULCAN PAVEMENT AND CLAY DIGGING TOOLS

LA CROSSE, WISCONSIN U.S.A.

ARE MADE in a complete line of sizes to fit all standard compressed air hammers.

Send for NEW Vulcan illustrated CATALOG today.

NOTED FOR QUALITY AND DURABILITY"

VULCAN TOOL MFG. CO.
QUINCY, MASS.

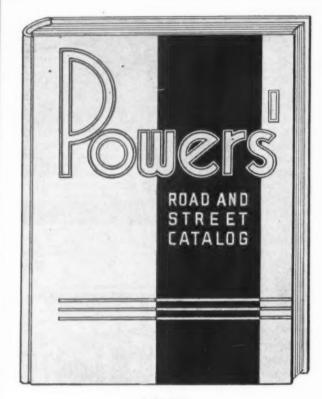
GATKE

SWINGING FRICTIONS -For tough jobs. Whatever your service
we have the materials and guarantee
results. Send dimensions and tell us
what you need.

GATKE CORPORATION, 230 N. LaSalle St., Chicago

BRAKE LINING -- CLUTCH FACINGS -- FRICTIONS





1 9 4 3 NINETEENTH ANNUAL EDITION

Schedule Space Now for the New, Revised Catalog

First aid!

POWERS' CATALOG Gives First Aid to Many New Buyers in the Highway Field when Seeking Information on Materials and Equipment.

Men now engaged in Highway and Airport Construction and Maintenance as it pertains to National Defense are attached to:

Field Procurement Offices of the War Department

Field Purchasing Offices of the Navy Department

County and Municipal Airports

Offices of the Engineer Corps

Engineering Training Schools

Engineer Replacement Stations

District Offices of W.P.A.

Washington Offices of Army, Navy and Air Corps

Field Offices of the Bureau of Yards and Docks

MILTON E. SENTER, Mechanical Inspector, War Dept., U. S. Army Engineers, says:

"I travel throughout the Pacific Northwest as an inspector of construction equipment for the Division Equipment pool. Everyone operating a machine and those connected with equipment in the offices are interested in your Catalog to familiarize themselves with the types and models. About 60 people use my Catalog."

JOHN S. ROBAS, Equip. Purchasing Agent for John A. Johnson Contracting Corp., and Mount Vernon Contracting Corp., writes:

"I have found this publication to be of immense value in writing specifications and buying and renting equipment. ***** I would appreciate receiving from you, with or without charge as you see fit, back editions of Powers' Road and Street Catalog" for as many years as you can conveniently supply. Please accept my congratulations for your success in turning out a definitely worth-while publication, and my assurance that your assistance is greatly appreciated."

POWERS' CATALOG offers a live file for your 1943 Equipment Story. It is used as a buyer's reference guide by Federal, State, City, and County Officials with purchasing power. New buyers and operators in the Army, Navy and Air Corps are finding the Catalog FIRST AID in helping them with their problems.

Details as to space rates or mechanical requirements sent on request

POWERS' ROAD AND STREET CATALOG

Published by
GILLETTE PUBLISHING COMPANY

330 South Wells Street Chicago, Illinois Ligh

and

none

well

Plan

Buck cated Road Stree

Clearing House

Exceptional Bargains IMMEDIATE SHIPMENT

1/2 yard General clamshell crane 74 yard Insley trailers 16'x30" Iowa nearly new revolving sand screen 110 Gallon Model 84WS Littleford tar kettle 4 yard Heil-Baker scraper

PAUL L. MATCHETTE CO.

Exclusive Distributors for Barber-Greene Co.

MISSOURI - KANSAS - OKLAHOMA 112 W. Ninth St., KANSAS CITY, MO.

FOR SALE:

3-20,000 gallon capacity storage tanks 30 x 10 Portable CRUSHING PLANT 30 x 10 Portable CRUSHING PLANT
4 x 8 Telsmith Vibrating SCREEN
3-000 x 1,000 Gal. DISTRIBUTORS
18 in. x 200 ft. BELT CONVEYOR
½ yd. Owen CLAMSHELL
2-1,000 ft. DIESEL AIR COMPRESSORS
30-1½ yd. and 3 yd. DUMP CARS
6 ORANGE PEELS-6 to 27 ft.
100 H.P. Lambert three drum ELEC. HOIST
5 Parsons & Cleveland TRENCHERS
2-2½ and 3 ton tendem gas ROLLERS
½ yd. P. & H. Gas Cat. Dragline
5-6 to 10 Ton Gas Locomotives
7 Yulcan & McKlernan Terry Pile Hammers
5 Gualte NI & N2 Cament Guns
4 KW Kohler lighting plant

Tidewater Equipment & Machy. Corp. New York, N. Y.

Sales Agents Wanted

Manufacturer of Snow Plow Warning Light. Those contacting State, County, and Township Officials and handling noncompeting lines desired. Product is well established and well received.

Address Box 496, Ronds and Streets, 330 S. Wells Street, Chicago, Ill.

B*U*S*T*E*D TIRES . . .

can often be fixed. Our "EQUA-FLEX" Sectional Repairs are dependable. Write for information and prices.
ALL Sizes—1800x24 to wheelbarrow tires

WALLACE TIRE SERVICE 2329 S. Michigan Ave.

FOR SALE

-Barber-Greene Model 848 Travel Plant, Mixer on pneumatic tires—Bucket Loader on full crawlers. Located western Nebraska. Box 1000, Roads and Streets, 330 So. Wells Street, Chicago, Ill.

FOR SALE OR RENT

-P & H 600 1 yard combination shovel and drag-line.
-Michigan % yard truck crane with shovel &

Alichigan % yard truck crane with shovel & clambell.

— 3, yd. Bucyrus Erie dragline bucket.

— 4, yd. Page Dragline bucket.

— 14, yd. Page Dragline bucket.

— 14, yd. Page Dragline bucket.

— 15, yd. Bay City dragline bucket.

— 5, yd. Rieler elamshell digging bucket.

— 6, yd. Kielier elamshell digging bucket.

— 6 lion 10 ton 3-wheel gas rollers.

— 10 ton Galion Chief 3-wheel Diesel roller complete with electric starter and scarifier.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 5 ton Galion gas roller 5 ton 3-wheel.

— 6 ton Galion gas roller 5 ton 3-wheel.

— 7 ther LeRel 105 gas driven portable compressors.

— 220 cuble foot Bullivan gas driven portable compressor.

— 5 ton Galion gas roller 5 ton 5 wheel.

-Demonstrator LeRoi 110 cu. ft. 2-stage gas driven compressor. -105 cu. ft. 2-stage Schram compressor. -105 cu. ft. Utility Type Schram compressor mounted en Chevrolet truck. -Cleveland Model DRS Wagon Drills. -Cleveland Model DA10 Wagon Drills. -Cleveland Model DA10 Wagon Drills. -Kohler 146 KVA, 1500 Watt AC gas engine driven light plants. -Kohler 1500 Watt, 110 Velt DC engine driven light plants.

Hight plants.

Worthington pneu. backfill tampers.

Worthington pneu. rivet bustar.

800 amp. Lincoln gas driven welder.

4" Carver Centrifuga pumps.

8' Adams pull grader.

Chicago Construction **Equipment Company** hone: Radeliff 58

8020 S. Halsted St., Chicago, Illinois

FOR RENT

COMPLETE EQUIPMENT FOR ROAD WORK:

All sizes of Road Forms, Curb Forms, Material and Cement Bins, Finishers, Spreaders, Buckets, Subgraders, Formgraders, Tampers, Pave Power Graders, Batch Boxes, etc. Tampers, Pavers,

COMPLETE EQUIPMENT FOR **BUILDING CONSTRUCTION:**

Mixers, Hoists, Air Compressors, Pumps, Saw Rigs, Shores, Column Clamps, Complete Air and Electric Tools, Towers, Welders, Heaters,

Dravo-Doyle Co. 2601 Preble Ave., Pittsburgh, Pa.

EQUIPMENT FOR SALE

-Railroad Steam Asphalt Plant. 1000 Lbs. mixer -10,000 gallon Asphalt storage tanks -8,000 gallon Fuel Oll Tank -Buffalo-Springfield 3 wheel 12 ton steam roller -Iroquois Tandem 10 ton steam

1—Iroquois Tandem 10 ton steam roller
1—Austin Western 8 ton gas roller
1—P. & H. % yard steam clam
1—Bucyrus % yard steam shovel and clam
1—Koehring Paver 10 E.
5,000 Lineal feet of 5 and 12 inch metal forms
Asphalt tool wagon and asphalt tools

Badger Construction Co. 818 Railway Exchange Bldg. MILWAUKEE, WIS.

TRANSITS and LEVELS

New or Rebuilt Sale or Rent

Headquarters for REPAIRS — any make. Factory Service. We will also buy your old in-

struments or take them in trade. A complete line of Engineering Instruments and Equipment for Field or Office. Write for Bulletin RS 710.

WARREN-KNIGHT CO. Manufacturers of Sterling Transits and Levels 136 N. 12th St. Philadelphia, Penna.

EQUIPMENT FOR SALE

- Austin-Western 4-44—all wheel drive and steer—9.00 x 24 dual rubber tired tractor.
- 1—Cletrac DDH tractor.
 1—Caterpillar "60" gasoline tractor.
 1—Ateco scraper to fit Cat. "60".
- -Niagara 2 deck 3' x 8' screen
- Austin-Western 32" x 14' revolving
- -6" Centrifugal pump 2 stage with 4 cylinder Hercules motor.
- -No. 104 Austin Gyratory crusher with back gear.

Subject to prior sale

TELFORD EQUIPMENT COMPANY 319 East North St., Lansing, Michigan Tel. 4-3424

WANT TO BUY
Locomotive Cranes
Whirley Cranes 80' or 125' Boom
Portable Conveyors 40' to 60'
1½ to 2 ton Tandem Rollers
10,000 Gal. Cap. Steel Tanks
Mile Portable Track

Leicester Contracting Corporation 305 Madison Ave., New York, N. Y.

FOR SALE

- 1 Buckeye Model 201 Type C
- 1 P H 15-36
- 1 Austin 110

Box 491, Roads and Streets, 330 So. Wells St., Chicago, Ill.

POSITIONS WANTED

POSITION WANTED by middle aged dirt mover and paving foreman. 25 yrs. experience as Supt. and Foreman on all classes of work with all makes of equip-ment. Heavy sewer experience. Available at once. Dependable and sober: Refer-ences. Address Box 489, Roads and Streets, 330 So. Wells St., Chicago, Ill.

POSITION WANTED: As Superintendent or Foreman. 10 years experience on general construction, sewer and water systems, concrete masonry, foundations, coffer dams and piling, clearing and grubbing, grading. Available at once. American citizen, references. Box 1001, Roads and Streets, 330 So. Wells St., Chicago, Ill.



Experienced Contractors Choose These Couplings for the Real Tough Jobs!

ON HYDRAULIC, STEAM OR AIR HOSE



"GJ-BOSS" GROUND JOINT STYLE X-34 FEMALE HOSE COUPLING

Instead of a washer, this coupling has a perfect soft-te-hard metal union between spud and stem that remains leakproof, regardless of wear. Exceptional gripping power is provided by strong malleable iron "BOSS" Offset Interlocking Clamp. Designed to protect hose ends. Sizes: 1/2" to 4", inclusive.

ON AIR HOSE



"GJ-BOSS"
GROUND JOINT

AIR HAMMER COUPLING

Same seasherless construction as Style X-34, above—no delays to replace worn or mislaid washers.

Correctly designed "BOSS" Interlocking Clamp grips coupling to hose in a way that climinates all danger of blow-offs.

Compact Type, Style XLB-61 1/2" and 3/4" Heavy Type, Style XHB-72, 3/4" and 1"

Carried by Manufacturers and Jobbers of Mechanical Rubber Goods

DIXON VALVE & COUPLING CO.

Main Office and Factory: PHILADELPHIA, PA.

Branches:

Chicago e Birmingham e Los Angeles e Houston

Index to Advertisers

The Dash (-) Indicates that the Advertisement Does Not Appear in This Issue

Α.
*Adams Company, J. D Second Cover
American Creosoting Co
*Baker Manufacturing Co., The. — *Barber-Greene Co. — Barrett Company, The. 63 *Bethlehem Steel Company. 1 Blackhawk Mfg. Co. 21 Blackstone Hotel 20 *Blaw Knox Company. 27 Briggs & Stratton Corp. 59 Brooks Equipment and Mfg. Co. — *Buckeye Traction Ditcher Co. 22 Bucyrus-Erie Co. 31 *Buffalo-Springfield Roller Co. — *Burch Corporation, The. 98 Byers Machine Co., The. 93
Calcium Chloride Association
Concrete Surfacing Machinery Co
Electric Wheel Co
*Four Wheel Drive Auto Co., The14-15 G *Galion Iron Works & Mfg. Co., The11 Gatke Corporation
Grace Mfg. Co., W. E Grohne Concrete Products Co Gruendler Crusher & Pulverizer Co Gulf Oil Corporation
*Heltzel Steel Form & Iron Co. — *Hercules Co. — *Hercules Powder Company. — Hercules Steel Products Co. 95 Hetherington & Berner, Inc. 20
Ingersoll Co., Chas. M
K K K K K K K K K K

*La Crosse Trailer & Equipment Co... 99 Leicester Contracting Corp......101

Le Tourneau, Inc., R. G
M Mack Trucks, Inc
National Automotive Fibres, Inc — National Paving Brick Association —
Ohio Oil Company, Inc., The — *Osgood Compan, The 96 *Owen Bucket Co., The 20
Paris Manufacturing Co., Inc. — Philadelphian Hotel 99 Pierce Governor Co., The. — *Pioneer Engineering Works 32 Pitman Publishing Corp. — *Portland Cement Association — Powers Road & Street Catalog 100 Preformed Wire Rope —
*Rapid Pavement Breaker Corp. 96 Raybestos Division 86 Raybestos-Manhattan, Inc. 86 *Reilly Tar & Chemical Corp. 90 Rogers Brothers Corporation 90 Root Spring Scraper Co. 90
Sauerman Bros., Inc. 98
Telford Equipment Co
Vulcan Tool Mfg. Co 99
Wallace Tire Service, Inc
York Modern Corp
* Advertisors with * are represented in

* Advertisers with * are represented in the 1942 edition of Powers' Road and Street Catalog and Data Book. Please refer to it for additional information on any of their products.



60% of industrial safety directors recognize that wire rope can be dangerous for workmen. A great many of them recognize that preformed wire rope is much the safer type.

• Perhaps you can't altogether correct lost-time due to illness—but you can do much to prevent accidents. Take wire rope for instance—many operators have never had a lost-time accident due to punctured hands and subsequent blood-poisoning. But many have—and in these days of emergency demands, any such accident is too many.

American Cable TRU-LAY <u>PREFORMED</u> is the safest possible rope to use. Worn or broken crown wires lie flat and in place. No wicked barbs to tear hands. TRU-LAY resists kinking and whipping, too—thereby handling easier, faster, safer. And acknowledgedly—it lasts longer than non-preformed.

Specify American Cable TRU-LAY PREFORMED—the safer rope. All American Cable ropes identified by the Emerald Strand are made of Improved Plow Steel.

AMERICAN CABLE DIVISION

1

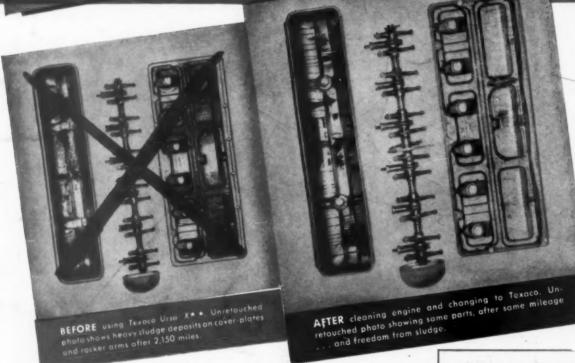
5

Wilkes-Barre, Pa., Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc. GRADGEPORT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fonce, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . In Business for Your Safety

PHOTOGRAPHIC THAT ENGINES STAY PROOF STAY



AS THE larger unretouched photo shows, engines can be kept clean ... assuring full power and maximum fuel economy ... when lubricated with Texaco Ursa X * *.

The exclusive use of $Ursa\ X \ * \ *$ keeps both Diesel and gasoline engine pistons, rings, valves and other parts 3 TIMES CLEANER than ordinary lubricating oils . . . by holding fuel soot and other deposit-forming materials in suspension so that they are drained away at regular oil-change periods.

Using $Ursa\ X \star \star$, oil lines and filters also stay clean; modern bearings

are protected in the heaviest service.

The outstanding performance that has made Texaco preferred in the fields listed in the panel has made it preferred on prominent construction jobs throughout the country.

These Texaco users enjoy many benefits that can also be yours. A Texaco Automotive Engineer will gladly cooperate... just phone the nearest of more than 2300 Texaco distributing points in the 48 States, or write:

* * *

The Texas Company, 135 East 42nd Street, New York, N. Y.

THEY PREFER TEXACO

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

* More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and cars in the U.S. are lubricated with Texaco than with any other brand.

TUNE IN FRED ALLEN EVERY SUNDAY NIGHT-CBS



TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY